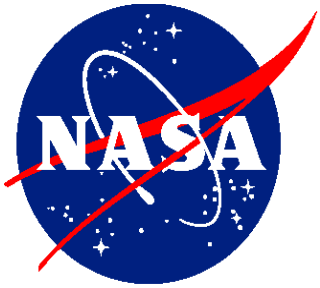
NASA/SP-2010-3406



Integrated Baseline Review (IBR) Handbook

National Aeronautics and Space Administration
NASA Headquarters
Washington, D.C. 20546

February 2013

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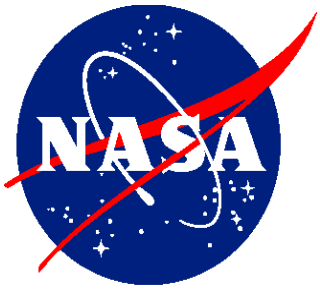
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RECORD OF REVISIONS		
REV LTR	**DESCRIPTION**	**DATE**
	Basic Issue	February 21, 2013

1.0 INTRODUCTION

1.1 Background

An Integrated Baseline Review (IBR) is a review of a supplier's Performance Measurement Baseline (PMB). It is conducted by Program/Project Managers and their technical staffs on contracts and in-house work requiring compliance with NASA Earned Value Management System (EVMS) policy as defined in program/project policy, NPR 7120.5, or in NASA Federal Acquisition Regulations. The IBR Handbook may also be of use to those responsible for preparing the Terms of Reference for internal project reviews. While risks may be identified and actions tracked as a result of the IBR, it is important to note that an IBR cannot be failed.

The objective of the IBR is to confirm compliance with the following business rules:

- The technical scope of work is fully included and consistent with authorizing documents
- Key schedule milestones are identified
- Supporting schedules reflect a logical flow to accomplish the technical work scope
- Resources (budgets, facilities, personnel, skills, etc.) are adequate and available for the assigned tasks
- Tasks are planned and can be measured objectively, relative to technical progress
- Underlying PMB rationales are reasonable
- Managers have appropriately implemented required management processes

An assessment of the management reserve with respect to risk not accounted for in the PMB should be made as well.

An IBR is intended to be an extension of the supplier's existing management practices. Anything that does not support the intent of the IBR should be moved outside the review. Risks associated with Technical, Schedule, Cost, Resource, and Management Processes that are identified during the IBR should be reviewed; action risks should be incorporated into the project's existing risk management process."

1.2 Purpose

This document is intended to be a how-to guide to prepare for, conduct, and close-out an IBR. The document lists the steps that should be considered for each IBR, and offers tips for tailoring the IBR based on risk, cost, and need for management insight. Appendices to this handbook contain samples of documentation typically used in connection with the IBR. Please note that

these appendices are samples only, and should be tailored to meet the needs of individual projects and contracts. These attachments are available in native format on the NASA EVMS Web Site at http://evm.nasa.gov/handbooks.html..

While an IBR has traditionally been conducted on contracts, it can be effective when conducted on in-house work as well. The same principles, objectives, and processes apply for in-house and contract IBR's; however minor changes may be necessary to the steps in conducting an IBR.

Appendix A contains an IBR Checklist that can be used as a guide in conducting the IBR and ensuring that all steps are considered.

1.3 Authority

It is not a requirement to use this document, nor does this document intend to create or levy new requirements on a NASA project or contract. It is simply intended to aid customers and suppliers preparing for an IBR to understand expectations of the IBR. Following this guide will help to ensure that the IBR is successful. Using this document will also help to meet NPR 7120.5 IBR requirements for in-house programs and projects, as well as the NASA Federal Acquisition Regulation Supplement (NFS) 1852.234-2 IBR requirements on NASA contracts.

1.4 Applicability

The objectives of an IBR are applicable and beneficial to projects and contracts of all sizes and types; however the level of detail and formality of the review vary based on dollar value, risk, and need for management insight. The IBR Team Leader should determine if the Decision Authority or Technical Authority have prepared a Terms of Reference for the project. The IBR should be consistent with the Terms of Reference and assure an adequate level of detailed information and analysis is provided to the Decision Authority and Technical Authority. The Mission Directorate may impose unique guidelines for the IBR.

NASA has many reviews during the program and project lifecycles, and some of these reviews share common goals and objectives with the IBR. Therefore, when possible, the IBR can be combined with these other reviews. It is important, however, to ensure that the intent of the IBR still be met and supported by key personnel when reviews are consolidated.

Appendix B contains a sample format for an IBR for a very small, low-risk project. For a project of this size, it is not unusual to have one person act as the Control Account Manager (CAM) for all control accounts. In this case, the IBR usually occurs in one day and consists of one team conducting all CAM discussions. Often, a presentation format is used to present relevant data to the IBR team, and this information should be furnished to the IBR team at least one week before the review.

1.5 Document Structure

This guide is divided into three major sections: IBR Preparation, On-site IBR, and IBR Closeout.

2.0 IBR PREPARATION

2.1 General

Preparation is the foundation for a successful IBR. The preparation portion of the IBR is the most important part of the entire process. Preparation includes the planning that identifies key responsibilities, required technical expertise, IBR and/or EVM training, review dates, review scope, risk evaluation criteria, documentation needs, disposition of findings, and procedures for risk identification, documentation, and incorporation into the project's risk management planning.

2.2 Determination of Need for an IBR

The need for an IBR must be determined early on - prior to contract award for contracts and in the program and project plans of in-house work. The requirement for contract IBR's is contained in NASA Federal Acquisition Regulation Part 1852. The requirement for in-house IBR's is contained in NPR 7120.5. In addition, the Mission Directorate may establish unique IBR requirements and thresholds that must be followed. The Project Plan should identify the contracts and in-house work that will require an IBR, including flow-down of IBR requirements to major subcontractors. An IBR may also be planned for efforts that do not meet the dollar thresholds in 7120.5, but that have significant risk or require more management attention. Including the clause at 1852.234-2 in a solicitation will notify potential bidders of NASA's intent to conduct IBR's. In addition to that clause, or in a case where the clause is not included in the RFP or contract, it is a good idea to provide suppliers with more details about the IBR. This will ensure that clear expectations are established and provide NASA the ability to tailor IBR requirements. Appendix C contains sample IBR language that can be used in solicitations, contracts, or even in-house agreements.

2.3 IBR Planning

The customer should begin preparation for the IBR should begin as soon as practical after determining the need for an IBR. The program or project manager should appoint an IBR Coordinator and a Review Facilitator early-on to help facilitate the IBR. The IBR Coordinator helps to coordinate various activities to ensure a successful IBR. The Review Facilitator provides the team members with earned value management expertise. The roles of the IBR Coordinator and Review Facilitator are further described below.

The first step in planning the IBR is to determine which control accounts will be reviewed at the IBR. A Responsibility Assignment Matrix (RAM) that shows the budget separately broken out for each control account will help in this assessment. See Appendix D for a sample RAM and Section 2.4 for a more detailed description of the RAM. A RAM or equivalent document must be requested from the supplier or project. Typically 85% of the dollar value and all of the high risk areas should be examined. Usually, at least one Level-Of Effort (LOE) and one material account will be included to provide insight into various aspects of the project. The Program or Project Manager, with advice from the Review Facilitator, should choose the control accounts for the IBR and inform the supplier, usually informally, of the ones selected.

Team composition and assignments are based on which control accounts are selected for review. Participants should be identified based on their expertise as required for the review. These disciplines include program and project management, business management, and technical management (e.g., system engineering, software engineering, manufacturing, integration and test engineering, and integrated logistics support). When appropriate, the team should include subcontractor, Defense Contract Management Agency (DCMA), and Defense Contract Audit Agency (DCAA) personnel. There may be several sub-teams with discussions scheduled concurrently, or one team can interview every CAM. Each of these teams should be assigned a sub-team leader to lead the discussion. To be effective, the discussion group should remain small and focused, usually 3-4 people per team. Typically, the technical experts for NASA will lead the discussion. A sample team may consist of an EVMS analyst, a Project Manager, and one or two technical experts in the area of the Control Account (CA) to be discussed. A good rule of thumb is to allow at least two hours to conduct the CAM discussions and one hour for completing documentation.

2.4 Customer Team Roles and Responsibilities

Program or Project Manager (PM): The PM either acts as or assigns the Team Leader for the IBR. The overall responsibility of conducting the IBR lies with the Team Leader. The Team Leader is responsible for coordinating the activities of all individuals assigned to perform the review. Some individual tasks to be performed by the Team Leader are described below.

a. Coordinate with the supplier to discuss the IBR strategy, areas to be reviewed, and tentative dates for the IBR.

b. Choose appropriate team members and assign responsibilities.

c. Ensure team members are adequately trained and prepared. Provide IBR training and workshops as necessary to prepare the team before the review begins.

d. Provide technical direction and leadership emphasizing the importance of thorough cost, schedule and technical integration of work.

e. Provide an in-brief and out-brief at the IBR.

f. Provide an overall evaluation of the IBR and assess whether or not a follow-on review will be required.

g. Document review findings. The format of this documentation is at the discretion of the Team Leader. Sample formats are included as part of the IBR Guidance Package in Appendix F.

h. Ensure that all issues identified during the review are resolved in an appropriate and timely manner. Assign action items and completion dates to appropriate government and supplier personnel. Schedule action item review as necessary.

i. Define the risk evaluation criteria to generally categorize the risk that may be identified at an IBR: cost, schedule, technical, resource, and management processes. Appendix F, the IBR Guidance Package, contains sample criteria for each type of risk.

IBR Coordinator: The Team Leader may appoint an individual as IBR Coordinator whose function entails coordination of various activities to ensure a successful Integrated Baseline Review. This includes but is not limited to coordinating review dates, obtaining information necessary for the review, organizing this material, and coordinating the various aspects among the government and supplier review participants. The following is a recommended guide to assist the coordinator in performing this role.

a. Coordinate the review dates that are amenable to all parties. Consideration should be given to a time period that is the least disruptive to ongoing activities. Normally scheduling the review in the early part of the month after the close of the accounting period and statusing activities is the most appropriate time.

b. Provide written notification of the IBR to the supplier. Send the letter to all of the team members for informational purposes.

c. Obtain a list of the IBR Team members from the Team Leader.

d. Coordinate with individual team members to ensure travel and security arrangements have been accomplished.

e. Prepare the IBR Guidance Package.

f. Collect information and data requested in the IBR notification letter; compile and sort the information by sub-team responsibilities; and make this information, along with the IBR Guidance Package, available to the respective sub-team leads.

g. Schedule an IBR Kick-Off meeting to allow team members to familiarize themselves with the documentation and develop questions to be addressed during the review.

h. Collect the IBR Concern Area Report Forms or questions that have been generated during the pre-IBR meeting for the Team Leader's review. Forward those deemed appropriate by the Team Leader to the supplier for resolution. The IBR Coordinator will perform this function during the on-site review also.

i. Coordinate with the Team Leader to ensure all team members receive necessary IBR training prior to the review.

j. Distribute IBR forms, either hard-copy or electronic format, to team members prior to CAM discussions.

k. Collect documentation at the IBR.

l. Establish and maintain an IBR log.

Review Facilitator: Duties and responsibilities of the IBR Review Facilitator include providing the team members with earned value management expertise. This is accomplished through the review of documentation, assessing earned value status, and interpreting issues that relate to overall earned value management. The Review Facilitator should be an EVM

Working Group member from the Center if possible. The items listed below are provided as a recommended guide to assist the facilitator in the accomplishment of this role.

a. Determine status of the EVM system. If applicable, request documentation showing that the EVM system has been previously accepted by the government. When applicable, contact the local DCMA representative to determine if there are any outstanding earned value management system problems that would affect the quality of the performance measurement data.

b. If the EVM system requires previous government acceptance and has not met that requirement, coordinate with appropriate personnel the means by which this acceptance can be accomplished.

c. Review management processes that will be used in the management of the work.

d. Provide earned value management expertise to the IBR Team by assisting team members in the understanding of any EVMS data obtained prior to the review.

e. Coordinate with the Team Leader and IBR Coordinator in determining the interview schedule.

f. Review the experience and background of the team participants and provide a recommendation to the team leader of the type and amount of EV training deemed necessary.

g. Provide assistance to IBR Team members in determining whether individual tasks have been assigned appropriate earned value techniques used for measuring progress.

h. Assist the team leader in the development of the risk evaluation criteria.

i. The IBR Facilitator reviews all action items generated to ensure that earned value issues requiring follow-up are appropriate and necessary.

j. Provide assistance to the Team Leader with the preparation of both the in-briefing and out-briefing at the IBR.

Sub-team Technical Lead: The Sub-team Technical Lead is normally a technical expert who specializes in the area that is being addressed during the CAM discussion. The responsibilities of the Sub-team Technical Lead include:

a. Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.

b. Review documentation prior to baseline discussions with the CAM.

c. Lead CAM and senior manager discussions.

d. Establish the strategy for conducting the CAM discussions, e.g., designates a single person to lead the discussion, someone to take notes, etc.

e. Ensure all applicable documentation is properly completed (i.e. Discussion Assessment Form, Concern Area Report, Documentation Request Form, and Risk Assessment Form).

f. Provide daily out-briefs to keep the IBR Team informed.

g. Provide an assessment of risk based on the prescribed risk evaluation criteria.

h. Assist in the preparation of the IBR out-brief.

Technical Subject Matter Expert (SME) Team Members: Team members may include technical experts, EVM analysts, procurement representatives, DCMA, as well as other personnel who may be of benefit during the review. Duties of team members include:

a. Attend the pre-IBR meeting, including training and documentation review, prior to the start of the IBR.

b. Review documentation prior to baseline discussions with the CAM.

c. Conduct CAM and senior manager discussions.

d. Assist in completing all applicable documentation.

e. Provide an assessment of risk based on the prescribed risk evaluation criteria.

f. Assist in completing IBR documentation.

g. Assist in the preparation of the IBR out-brief.

Schedule Analyst: The duties of the Schedule Analyst include:

a. Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.

b. Review documentation prior to baseline discussions with the CAM.

c. Conduct CAM and senior manager discussions.

d. Review the EVM Systems Description or management processes to understand the processes and procedures by which the Integrated Master Schedule is created and maintained.

e. Provide an assessment of all project risk based on the defined risk evaluation criteria.

f. Assist in completing all IBR documentation.

g. Assist in the preparation of the IBR out-brief.

Cost Analyst: The responsibilities of the Cost Analyst include:

a. Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.

b. Review documentation prior to baseline discussions with the CAM.

c. Provide insight into the reliability of the Basis Of Estimate.

d. Inform the team of any areas where the independent or non-advocate estimates differ from the advocate estimate.

e. Conduct CAM and senior manager discussions.

f. Provide an assessment of all project risk based on the defined risk evaluation criteria.

g. Assist in completing all IBR documentation.

h. Assist in the preparation of the IBR out-brief.

Having a representative from the Independent Program Assessment Office (IPAO) and/or Systems Management Office (SMO)on the IBR team is recommended to ensure an independent member of the review panel. The team member will provide a common thread for all reviews at a particular Center to ensure consistency across all the reviews and provide an avenue for lessons learned to be communicated across the Center. This will also familiarize the SMO or IPAO representative with the project to make independent evaluations that occur later in the project life cycle more thoroughly and efficiently conducted and completed.

It is also important to include trainees and observers as part of the IBR process. This is a good way to provide training to people who may need to participate in a future IBR.

2.5 Determine Supplier Readiness for the IBR

Prior to the IBR on-site review, the IBR Team must assess the readiness of the supplier to conduct an IBR. Below are some rules of thumb to help determine IBR readiness.

- The PMB should reflect the entire scope of work.
- The schedules reflect the entire scope of work.
- It is good to have at least two reporting cycles worth of data before the IBR. This will provide the IBR Team with some performance measurement data as well as a feel for the accuracy of the data.
- Look for detail planning to the work package level for six months to one year to ensure an adequate assessment of the baseline.

The IBR Team must measure the ability of the supplier to meet the intended objectives prior to conducting the IBR on-site review. The IBR is not just a check in the box! If after the IBR, the Program or Project Manager does not feel that the IBR met the objectives, a second IBR must be performed.

2.6 IBR Notification Letter/Documentation

An IBR notification letter should be prepared and sent to the supplier within 3 months of the scheduled on-site IBR. This notification letter can take any form but should include the following information: the purpose of the review, the time frame of the review, the agenda, documentation requested, team requirements (ex: fax and phone access, meeting rooms, etc), IBR Team members and roles, and points of contact for follow-up. See Appendix E for a sample IBR notification letter. For contracts and subcontracts, the IBR Notification Letter should be sent from the government Contract Technical Representative to the contractor organization. The local DCMA and DCAA organization, if applicable, should be informed of the review.

One of the main functions of the notification letter is to request documentation for use on-site and prior to the review so that the team can prepare. This documentation will be used by the team to identify risk areas and to develop preliminary questions for the on-site review, and should be received 2 – 4 weeks prior to the IBR. The following is a listing of some of the documentation that may be requested.

a. Organizational Breakdown Structure (OBS)
b. Control Account Plans (CAP): Basis of Estimates (BOE), Assumptions, and Risk
c. Work Authorization Documents (all levels)
d. Performance Measurement Reports (internal cost/schedule reports)
e. Estimate at Completion (EAC)
f. Budget Change Requests (BCR):
g. Control Account (CA)/Work Package (WP) summary containing:
 - Number of work packages by type of EVM method
 - Longest CA, shortest CA, mean and median duration, total value of account
 - Largest CA, smallest CA, mean and median values
h. Baseline Control Logs (Management Reserve, Undistributed Budget, Contract Budget Base)
i. SOW with Work Breakdown Structure (WBS) Matrix
j. Schedules (Master, Intermediate, and Detailed)
k. EVM System Description
l. Description of Management Process such as baseline maintenance, risk management, and other business processes
m. Financial Management Reports such as 533M/Q or equivalent
n. All Contract Performance Reports (CPR) submitted to date
o. Responsibility Assignment Matrix (RAM)
p. WBS or Contract Work Breakdown Structure (CWBS) and Dictionary
q. Subcontractor listing and value of subcontracts
r. All authorized changes
s. Contractor/Subcontractor Flow-Down Requirements
t. Risk Register from Risk Management System

Only request data that has not already been received. Also, this list should be tailored based on information required for preparation and insight. The supplier may have the data described above in different formats, and these documents are acceptable and even preferred as replacements when the information is sufficient.

Responsibility Assignment Matrix (RAM):

The RAM correlates the work required by a WBS or CWBS element to the functional organization responsible for accomplishing the assigned tasks. The RAM results from the intersection of the WBS or CWBS with the organizational structure. This intersection identifies the CA. The RAM includes the functional organization and the individual responsible for the CA, known as the CAM as well as the budget for each CA.

Work Authorization Documents:

All work, regardless of origin, is described and authorized through the work authorization system. Work authorization assures that performing organizations are specifically informed regarding their work scope, schedules for performance, and budget for that work.

Work authorization is a formal process related to various levels of the organization. Agreement is reached to each level of authorization so that there is no question as to what is required. The CA authorization represents an agreement between the CAM and the authorizing party. The documents involved in work authorization, at each level, are maintained in a current status as revisions take place.

Cost/Control Account Plans (CAP):

A CAP is a plan of all effort to be performed in a cost/control account. The CA is the focus for planning, monitoring, and controlling because it represents work within a single WBS or CWBS element, and it is the responsibility of a single organizational unit or work team. Virtually all aspects of a project come together at the CA level, including budgets, schedules, work assignments, cost collection, progress assessment, problem identification, corrective actions, and EAC development.

A Work Package (WP) is a detailed job that is established by the CAM for accomplishing work within a CA. A WP can be characterized by the following:

a. The WP represents units of work at the levels where the work is performed.
b. A WP is clearly distinct from all other WP's, and is the responsibility of a single organization element.
c. A WP has scheduled start and completion dates (with interim milestones, if applicable), which are representative of physical accomplishment.
d. A WP has a budget or assigned value expressed in terms of dollars, labor hours, or other measurable units.
e. The duration of a WP is relatively short, unless it is subdivided into discrete value milestones that permit objective measurement of work performed.

f. The WP schedule is integrated with all other schedules.
g. The WP has a unique earned value technique for determining the value of completed and in-process work.

If a CA cannot be subdivided into detailed WP's, far-term effort may be identified in larger Planning Packages (PP's) for baseline control purposes. The budget for a PP is identified specifically for the work that is intended, is time-phased to the extent possible, and has controls that prevent its use in performance of other work. Eventually, all work in PP's will be planned to the appropriate level of detail in WP's.

Integrated Master Schedule (IMS)

Various schedules are essential to review before IBR discussions begin.

a. Integrated Master Schedule
 The Integrated Master Schedule is the controlling schedule for the entire contract or in-house work activity. It contains required milestones/activities. An integrated schedule developed by logically networking all detailed activities. The highest level schedule is the Master Schedule supported by Intermediate Level Schedules and by lowest level detail schedules.

b. Intermediate Schedule(s)
 Intermediate Schedules are the integrating schedules for a contract or in-house work activity. There may be single or multiple levels of intermediate schedules. They may be oriented to either WBS/CWBS elements or to functional organizations. In either case, the purpose is to form a bridge between the Master Schedule and CA schedules. The term "integrating" is used since the purpose is to coordinate the effort of a number of CA's that are related in one way or another to the scope of the intermediate schedule. Intermediate schedules are often the primary tool for identifying key interfaces through network logic.

c. Cost/Control Account (Detail) Schedules
 See Cost/Control Account Plans.

Electronic versions, in native vile formats, are necessary for providing insight into the various schedules.

Cost Reports:

As part of the documentation review process, it is important to review the supplier's latest cost report deliverables, i.e. 533M or 533Q, etc.

WBS/CWBS and Dictionary:

The Work Breakdown Structure or Contract WBS is the basis for further extension to lower levels that represent how the supplier plans to accomplish the entire work scope and is consistent with internal organizations and processes. This extended CWBS or WBS serves as the framework for reporting of cost and schedule status. The WBS or CWBS Dictionary is used to describe the effort and tasks associated with corresponding elements.

Once the documentation is received the next step is for the IBR Team to evaluate this documentation and determine risk areas. This evaluation of documentation, as well as other activities, can be conducted at a pre-IBR meeting. Questions may be held for discussion at the IBR or can be provided to the supplier prior to the IBR, allowing time to respond prior to the IBR team arriving at the facility. The questions can be informal or documented in a Concern Area Report (CAR). See Appendix F for a sample CAR. If the documentation review uncovers new risk areas, those control accounts should be added to the review schedule.

2.7 IBR Guidance Package

An IBR Guidance Package should be prepared that serves as a guide for the IBR Team. The IBR Guidance Package will assist the team members in conducting the review. The package provides the contract or in-house work background, sample discussion questions, documentation guidelines, sample documentation, risk evaluation criteria, and a glossary of EVMS terms. The review agenda and team assignments should also be included in the package. See Appendix F for a sample IBR Guidance Package.

2.8 Training

Training should be conducted at a Pre-IBR meeting. The three components of the training are basic EVM training, IBR training, and an overview by the supplier. The supplier can be a great help during the Pre-IBR meeting, by explaining documentation and answering any preliminary team questions. The supplier personnel can also give the team an understanding of management processes, such as baseline maintenance, risk management, and other business processes including EVM, that will be used to manage the project. Note that while EVMS processes are discussed at an IBR, the IBR is not an EVMS Validation Review. The team will also review the IBR Guidance Package during the training, and learn the use of the various forms and assessments used to document interview findings.

Training may be obtained from various sources and should be tailored based upon the needs and experience of the individual members of the review team. Training sources may be found by contacting the local NASA Training Coordinator or the NASA EVM Working Group. Names of members and contact information are listed on the NASA EVM Website.

If at all possible, the training and documentation review should occur prior to the on-site IBR. This will help to ensure a smoother review; provide the team an opportunity to review the data for completeness; and ensure readiness of the supplier. If the team is not able to have ample training and preparation time prior to the on-site review, sufficient time needs to be allocated to accomplish these efforts. Conducting the training and documentation review on-site

immediately followed by the CAM discussions may also be done. If this is done, make sure to allow adequate time for the team members to complete a review of the documentation prior to the start of the IBR discussions. See Appendix G for sample IBR and EVM Training.

2. 9 Travel Arrangements/IBR Logistics

Team members need to be informed as early as possible of the travel plans, of the review schedule and agenda, and of their assignments. Additionally, team members should know the name and number of a POC for the IBR, and security arrangements need to be made for each team member visiting the facility (i.e. Visit Requests need to be sent to the Security Office.) IBR Team members should also be provided area maps, directions to facilities, directions to visitor check-in, and specific directions to the building and room where the initial meeting or in-briefing will be held.

3.0 ON-SITE IBR

3.1 General

The preparation and planning done up to this point pay off at the on-site IBR. The primary purpose is for the Program and Project Managers to gain a mutual understanding of the risks inherent in the PMB and management processes. Anything that does not support this purpose should be discussed outside of the IBR. Any issues that arise during the IBR should be recorded, but resolved after the review.

The intent of this section is to provide sample tools and documentation for conducting the on-site IBR. While each IBR may be tailored, these tools will provide a starting point for conducting the review.

3.2 On-site Discussions

Once the IBR Team is on-site at the supplier's facility, several different activities must be considered. This section describes of each of these activities and their role in making the IBR successful. See Appendix H for a review in-brief template.

3.2.1 In-Briefs

3.2.1.1 Joint IBR Team and Supplier

In some cases the IBR team may want to provide an in-brief to the supplier at the start of the IBR. The main theme of this discussion is to re-emphasize that the purpose of the IBR is to evaluate the adequacy of the baseline and identify concerns, not to try to solve problems.

3.2.1.2 IBR Team-Only

The team may also want to conduct an IBR Team in-brief before the CAM discussions begin. This meeting is the final opportunity to focus the IBR Team on the objectives.

3.2.2 CAM Discussions

The CAM discussions are the key events of the IBR. These discussions focus on key risk areas and management processes. During this period the team members should cover the key aspects of the planning of the work scope. Overall success of the IBR results, in part, through productive CAM discussions. Following the techniques and formats below will help to ensure that adequate information is obtained in a timely manner to accomplish the objectives of the IBR.

3.2.2.1 CAM Discussion Guidelines

Below is a list of suggested techniques for all team members to consider before and during the CAM discussions.

a. Prior to the discussions, the IBR Team members should be familiar with areas previously identified for discussion. Review the documentation thoroughly.

b. Prior to the discussion, conduct a basic data and documentation trace to become comfortable with the data and how it flows through the system. Appendix I contains a documentation and data trace format that may be useful in conducting the trace.

c. Introduce yourself and identify the organization you represent. You may also wish to indicate your team affiliation in the review.

d. Be well prepared and maintain a tempo that keeps the discussion moving along toward satisfying your objective. Be friendly, but avoid long conversations extraneous to the discussion.

e. Take notes. The discussion leader (normally the Sub-team Technical Lead) or an accompanying team member should take notes during the discussion.

f. Request copies of documents only if necessary to accomplish the objective of the discussion. If documentation is not readily available, complete a Documentation Request Form and submit it to the IBR Coordinator. See Appendix F for a sample Documentation Request Form.

g. Watch the time. Discussions are normally scheduled for two hours in length. Should additional time be required to complete the discussion, coordinate with the Team Leader

h. If disagreements arise which cannot be resolved, the team member should write a description of the disagreement in a Concern Area Report and submit it to the Team Leader for disposition. The Team Leader will handle any continuing discussion.

 The supplier must ensure that each CAM is well prepared (documentation available, understands documentation content, can support answers, etc.).

3.2.2.2 Discussion Topics

Below are some examples of information that should be obtained from the CAM discussions. This list of questions is not all-inclusive and should be tailored for each project. Additional sample questions can be found in the IBR Guidance Package in Appendix F.

a. What is the Manager's scope of work? Does the Manager know what scope of work is his/her responsibility?

 The Manager should be able to show the team a Statement of Work (SOW) paragraph, a WBS, or CWBS narrative, and a Work Authorization Document that correlates to the task.

b. How did the Manager plan the scope of work into control accounts?

The SOW defines the effort. The WBS or CWBS provides specifics, such as work definition. The work authorization and change documentation should show information such as the dollars/hours, period of performance, and description of the scope of work and any changes.

c. How did the Manager ensure that all elements of the scope of work were planned?

The Manager should be able to show the team the work packages breaking down the scope of work, and the budget associated with each work package. The sum of the work packages and planning packages should be the control account budget. Each control account should contain a specific scope of work.

d. How did the Manager obtain the resources for assigned work?

This information should be obtained through the Work Authorization Document. The work authorization should provide specific resources used to manage the scope of work.

e. How did the Manager come to an agreement of the scope, hours, dollars and schedule?

f. Ask the Manager to show the team the schedule milestones used in the planning of the control accounts. The Manager should discuss:

- Schedule impacts
- Schedule impacts from other organizations
- Resource levels which support schedule milestones
- Schedule constraints
- Relationships to other tasks
- Logical relationships of work package to milestones
- Level of Effort (LOE) tasks that support the schedule
- The Manager should be able to show the team the activity supported on the appropriate schedule
- Critical path items for which the CAM is responsible

h. Ask the Manager how the work was time-phased to achieve the schedule.

All work should be logically planned in accordance with the scope of work and the schedule.

i. Ask the Manager to identify any known risks that may affect the plan.

j. Are the Manager's resources adequately planned and correctly time phased to meet the plan? Progress of each plan should relate to earned value.

k. Ask the Manager why he/she chose a particular type of earned value method.

 Does the earned value method used make sense for the type of work being performed? Can you measure performance? Is the Manager using milestones to measure accomplishments? Does the Manager use the LOE method; and is the LOE in support of measurable scope? Is LOE the appropriate earned value method for the task?

l. How does the Manager manage his/her plan?

 Does the manager use monthly reports, latest schedules, technical assessment of impacts, daily meetings, and continuous assessment of the plan?

m. How is the baseline maintained?

 How does the CAM ensure changes are incorporated into the baseline? What are the controls (retroactive, freeze period, etc.) to ensure the integrity of the baseline?

n. What is the risk management process? How is risk incorporated into the EAC?

o. What is the process for reviewing and updating EAC's?

p. How does the CAM update the schedule? How often are schedules updated?

3.2.2.3 IBR Documentation and Forms

After each CAM discussion, each Sub-team should sit down and review what was discussed. This is an opportune time to collect documentation to better prepare for the out-brief presentation. Each Sub-team Leader is responsible for documenting the team's assessments and findings. The Team Leader uses the documentation to support overall team assessments and required corrective actions.

The following forms have been developed to facilitate review documentation. Sample IBR forms are provided in the IBR Guidance Package in Appendix F. Note that these are just sample formats and program/project specific formats can be substituted.

Discussion Assessment Form:
The Sub-team should complete one of these forms after each discussion. The Sub-team Technical Leader is responsible for reviewing this form and submitting it to the Team Leader and the IBR Coordinator. Keep in mind that the Discussion Assessment Form can be tailored based on risk.

Concern Area Report (CAR):
A CAR should be completed for each concern noted. Generally, concerns noted are items that require follow-up action. Information on this form should be clear and as specific as possible because it will be provided to the supplier to obtain a response and resolution. Spell out abbreviations. These forms should be submitted immediately to the

Team Leader, and as soon as practical to the supplier. Responses should be provided to the IBR Team as soon as possible. Again, the Sub-team Leader is responsible for reviewing this form, and submitting it to the Team Leader and the IBR Coordinator. All forms will be compiled and logged.

Documentation Request Form:
During CAM discussions, the team may find that additional documentation is required to gain a better understanding of the issue in question. Use this form to obtain required documentation. Submit the completed form to the Team Leader and the IBR Coordinator. All forms will be tracked in order to reduce redundancies and ensure receipt of all the requested material.

Risk Assessment Form:
A risk assessment form should be completed after each discussion. Each risk and opportunity identified during the CAM Discussion is assigned a probability of occurrence. A potential cost and schedule impact for each risk and opportunity should be estimated, and a determination made as to whether this risk has been accounted for in the baseline. Each risk is classified as cost, schedule, technical, resource, or management process and assigned a rating based on risk evaluation criteria established by the NASA Program or Project Manager prior to the IBR. The ultimate goal of the Risk Assessment area of the IBR is an updated Estimate At Complete (EAC) or Life Cycle Cost estimate (LCC) which incorporates quantified risks. The Sub-team Leader is responsible for reviewing this form and submitting it to the Team Leader and IBR Coordinator. Risks identified at the IBR should be incorporated into the project's existing risk management plan.

General Assessment Form:
The form is used to document observations for those things that are "not CAR worthy", but might help EVM efficiencies (such as automatic links between IMS and EVM engine), as well as potential problem areas in the future based on previous IBR lessons learned. It is also used to document "best practices" for those things that improve the EVM process.

All forms should be compiled and logged in an IBR Log. The IBR log should consist of both potential and actual issues revealed prior to and during the review, and should contain the appropriate actions required along with anticipated completion dates. This IBR Log will support the Letter of Findings during the IBR Close-Out Phase discussed in Section 4. See Appendix J for sample IBR Logs.

3.2.3 Out-briefs

3.2.3.1 Daily Team Out-briefs

At the end of each day, the NASA IBR Team should conduct out-briefs where each sub-team reports findings from the CAM discussions. This will ensure that the entire team is aware of issues that have been raised by other teams, allowing further investigation during other CAM

discussions. A supplier representative can be a part of this meeting, helping to clarify any issues and resolve issues in a timely manner.

3.2.3.2 Final IBR Out-brief

An IBR team meeting should be conducted prior to the final out-brief where the IBR Team can discuss the brief and concerns. This will ensure that the IBR Team members have a clear understanding of any concerns and action items. The agenda for the IBR must ensure that ample time is made available to prepare the out brief presentation.

The Team Leader should provide an out-brief to the supplier at the end of the on-site IBR. The out-brief should be tailored for each contract or in-house work activity; however several areas should be included. First, the brief should include assessments of each area's PMB discussed (pros and cons) as well as all Concerns and Action Items. Next, a summary of the overall risk should be included as part of the out-brief as well. Finally, the Team Leader should provide an overall evaluation of the IBR and assess whether or not a follow-on review will be required. This decision is based on the Team Leader's assessment of whether the objectives of the IBR have been achieved.

A sample IBR Out-Brief can be found in Appendix K.

The Team Leader may also want to have the Sub-team Technical Leaders brief their area(s) of expertise. In addition, the Review Facilitator should note to the team any concerns and issues related to the management processes.

4.0 IBR CLOSEOUT

4.1 General

Once the IBR out-brief is completed, the closeout portion of the IBR process entails the review of all corrective actions identified during the IBR and the establishment of a plan to formally close out the IBR. The Program and Project Managers should agree on the closure plan of action and identify the individual(s) responsible for all identified risks. This phase also includes capturing lessons learned from the IBR process.

4.2 Letter of Findings/IBR Report

The results of the IBR should be reported to the supplier, and an IBR Report or a Letter of Findings can be used to effectively communicate these results. The IBR is an event required by the contract, therefore a letter to the contractor issued by the Contract Technical Representative (COTR) is customarily sent. The Review Facilitator should work with the Team Leader to generate the letter to the supplier. A letter will help to prevent the supplier from claiming that resolving actions resulting from the IBR are out of scope.

The purpose of the letter or report is to summarize all of the concerns that were found during the IBR discussions and to request a corrective action plan from the supplier. The corrective action plan should identify proposed corrective/preventative actions, responsibility assignments, and projected completion dates. Issues that could impact the performance measurement data should also be identified and a copy provided to the appropriate EVM Working Group member. Appendix L contains a template for a Letter of Findings and Appendix M contains an IBR Report format. The IBR Concern Area reports or a Concern Area summary spreadsheet would typically be acceptable attachments to the letter. Also, if an IBR Report is prepared, it should be included as part of the letter to the supplier.

As an alternative, the customer and the supplier could agree on a corrective action plan immediately after the IBR out-brief to ensure more timely resolution of issues. This will make certain that the concerns are understood and that the IBR team agrees with the corresponding corrective action plan. This can speed resolution of the Concern Area Reports and closeout of the IBR.

4.3 Tracking Concerns

Tracking the progress in resolving each concern rests with the Team Leader, including the Defense Contract Management Agency (DCMA) team representatives located at the contractor's facility when applicable. The IBR Coordinator should work closely with the IBR Team to ensure that all actions are closed. Regular project reviews are also another good place to have the follow-up on any actions that resulted from the review. Approval of corrective actions rests with the Team Leader, and most likely would be an iterative process.

4.4 IBR Closeout Letter

When all Concern Area Reports have been closed, the Team Leader will approve close out of the IBR. An IBR closeout letter is sent to the supplier indicating that all CAR's are either closed or being tracked and that the IBR is complete. Reporting the results of the IBR may take the form of an informal letter or memo for record, depending on the size and formality of the IBR. See Appendix N for a sample IBR Closure Letter.

4.5 Lessons Learned

After the IBR on-site review and actions have been agreed upon, it is important to poll the IBR participants for lessons learned. This includes the areas that worked well and those where improvements could be made. Lessons learned can come from both the IBR team and the supplier team. Lessons learned should be forwarded to the Agency's Program Executive for EVM as the Agency EVM Working Group is responsible for the Agency IBR Toolkit. This document was developed using best practices from previous IBR's, and therefore these are included within the document. In addition, below is a listing of some additional lessons learned from both in-house and contractor IBR's. This list is updated as IBR's occur.

a. If a form includes an assessment of CAM discussions, ensure that criteria for those ratings is established, clear, and objective. If an unfavorable rating is assessed, include rationale supporting the rating.

b. The team leader should discuss interview strategy with the team members prior to the interview to describe conduct of the review, i.e. who will ask questions, who will take notes, etc. This will ensure that team members understand roles and responsibilities during the discussions.

c. Supplier participation in the daily out-briefs can help to ensure that concerns are clearly communicated and understood. However, it is important to stress the purpose of the meeting is for team discussion of issues and not for resolution of those issues.

d. CAM discussions should not be scheduled for less than two hours to ensure that teams have enough information to answer questions on discussion and concern area forms. Ample time must also be allowed to poll all team members.

e. If the time allotted for CAM discussions is insufficient, work with the CAM to schedule additional time. This will eliminate the need for side-bar discussions, ensuring that the whole team is aware of the information.

f. Dedicate a room for the IBR team for the duration of the IBR.

g. Provide hard copies of logistics information (i.e. schedule, maps, etc.) to IBR team members as part of the in-brief on the first day of the on-site IBR.

APPENDIX A IBR CHECKLIST

IBR Event: _____

IBR Date: _____

Phase I - Organization & Planning				
	TARGET DATE	*DONE*	*RESPONSIBILITY*	*REMARKS*
Determine Need for IBR			Project Manager	
Appoint IBR Coordinator and Review Facilitator			Project Manager	
IBR Overview training for PM & leadership team			Facilitator	
Define CWBS/CA scope for IBR			Team Lead	
Request Responsibility Assignment Matrix (RAM) from Supplier			Team Lead	
Determine Supplier IBR Readiness			Team Lead	
Determine areas to be reviewed at the IBR			Team Lead	
Identify & Assign Review Team members			Team Lead	
Coordinate IBR dates and review agenda with the supplier and Program/Project Mgmt			Coordinator	
Formally notify supplier of Review & request project data & documentation			Coordinator	
Create a Common Data Repository/Archive site for IBR data drop			Coordinator	
Collect requested project documentation and distribute to IBR Team			Coordinator	
Define Risk Evaluation Criteria			Team Lead	
Prepare IBR Guidance Package			Coordinator	
Phase II - Prepare & Train for the IBR				
	TARGET DATE	*DONE*	*RESPONSIBILITY*	*REMARKS*
Conduct IBR Kick-off Meeting			Team Lead	
Provide training for Team Members			Team Lead	
Plan for Team travel and logistics for the On-site Review			Coordinator	
Coordinate with contractor/project team for On-site support required			Coordinator	
Collect concerns from the IBR Kick-Off Meeting and forward to supplier			Coordinator	
Determine Discussion Questions			Sub-team Lead	
Phase III - On-Site Review Activities				
	TARGET DATE	*DONE*	*RESPONSIBILITY*	*REMARKS*
Assemble Team on-site to review IBR plan and schedule			Team Lead	
Deliver IBR In-Brief at Kick-Off Meeting			Team Lead	
Conduct summary-level planning reviews and discussions/interviews			Sub-team Lead	Per interview or per day activities.

Conduct detailed (CA level) discussions/interviews			Sub-team Lead	
Hold daily end-of-day Team meetings to review issues/findings			Team Lead	
Prepare assessment Reports for each discussion/interview			Sub-team Lead	
Identify and request any additional data or documentation required			Coordinator	
Document concerns using the Concern Area Report (CAR) template			Sub-team Lead	
Document action items using the IBR Action Items template			Sub-team Lead	
Assign action items and completion dates to appropriate people			Team Lead	
Prepare final IBR Out-Brief and review with senior management			Team Lead	
Deliver final Out-Brief			Team Lead	
Phase IV - Follow-up Activities				
	TARGET DATE	*DONE*	*RESPONSIBILITY*	*REMARKS*
Formally notify Supplier of IBR Findings			Coordinator	
Monitor action item progress			Team Lead	
Notify Supplier of IBR Closure			Coordinator	
Schedule further IBRs as appropriate over the life of the contract/project			Team Lead	

APPENDIX B SMALL PROJECT IBR

Integrated Baseline Review (IBR)
Project Name

Project Manager's Name

Date

1

WBS/Work Description/Requirements

				BAC ($K)	Work Description	Requirement Paragraph
1	**Space System**			**3185**	**3.0**	
1.1		**Launch Vehicle**		**510**	**3.1.1**	**1**
1.1.1			Propulsion (Single Stage Only)	150	**3.1.1.1**	2
1.1.2			Stage I	120	**3.1.1.2**	3
1.1.3			Stage II...n (As Required)	150	**3.1.1.2**	3
1.1.4			Guidance and Control	60	**3.1.1.3**	4
1.1.5			Integration, Assembly, Test and Checkout	30	**3.1.1.4**	5
1.2		**Orbital Transfer Vehicle**		**590**	**3.2.2**	**6**
1.2.1			Propulsion (Single Stage Only)	220	**3.2.2.1**	7
1.2.2			Stage I	75	**3.2.2.1**	8
1.2.3			Stage II...n (As Required)	100	**3.2.2.2**	9
1.2.4			Guidance and Control	150	**3.2.2.3**	9
1.2.5			Integration, Assembly, Test and Checkout	45	**3.2.2.4**	10
1.3		**Space Vehicle**		**1650**	**3.2.3**	**11**
1.3.1			Spacecraft	600	3.2.3.1	12
1.3.2			Payload I...n (As Required)	300	3.2.3.2	13
1.3.3			Reentry Vehicle	450	3.2.3.2	14
1.3.4			Orbit Injector/Dispenser	225	3.2.3.3	15
1.3.5			Integration, Assembly, Test and Checkout	75	3.2.3.4	15
1.4		**Ground Command, Control, Communications and Mission Equipment**		**60**	**3.2.4**	**16**
1.4.1			Sensor I...n (As Required)	20	3.2.4.1	17
1.4.2			Telemetry, Tracking and Control	30	3.2.4.2	18
1.4.3			External Communications	10	3.2.4.3	19
1.5		**Flight Support Operations and Services**		**50**	**4.1.1**	**20**
1.5.1			Mate/Checkout/Launch	30	4.1.1.1	21
1.5.2			Mission Control	20	4.1.1.2	22
1.6		**Systems Engineering/Program Management**		**100**	**5.1.1**	**23**
1.7		**System Test and Evaluation**		**90**	**6.1.1**	**24**
1.1.7			Mock-ups	50	6.1.1.1	25
1.7.2			Test and Evaluation Support	40	6.1.1.2	26
1.8		**Training**		**50**	**7.1.1**	**27**
1.9		**Data**		**60**	**8.1.1**	**28**
1.9.1			Technical Publications	10	8.1.1.1	29
1.9.2			Support Data	20	8.1.1.2	30
1.9.3			Data Depository	30	8.1.1.3	31
1.10		**Initial Spares and Repair Parts**		**25**	**9.1.1**	**32**

2

Basis Of Estimate (BOE)

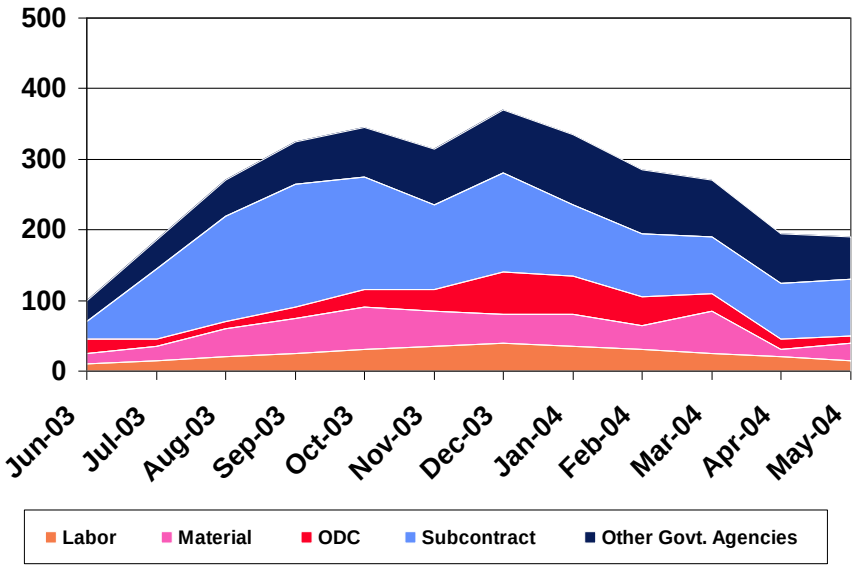
Program/Project/Activity Name						
WBS Element						
Description of Work Content						
Technical Parameters						
Ground Rules/Assumptions						
Labor / Material Breakout	Labor Hours	Labor $	Material $	Subcontract $	Other Govt. Agency $	ODC $
NASA Labor						
Contractor/Subcontractor						
TOTAL	0	0	0	0	0	0

BASIS OF ESTIMATE: (i.e., analogous programs, historical data, parametric estimates, etc.)

CALCULATIONS / ADJUSTMENTS: (show adjustments to data and explain reason for adjustments)

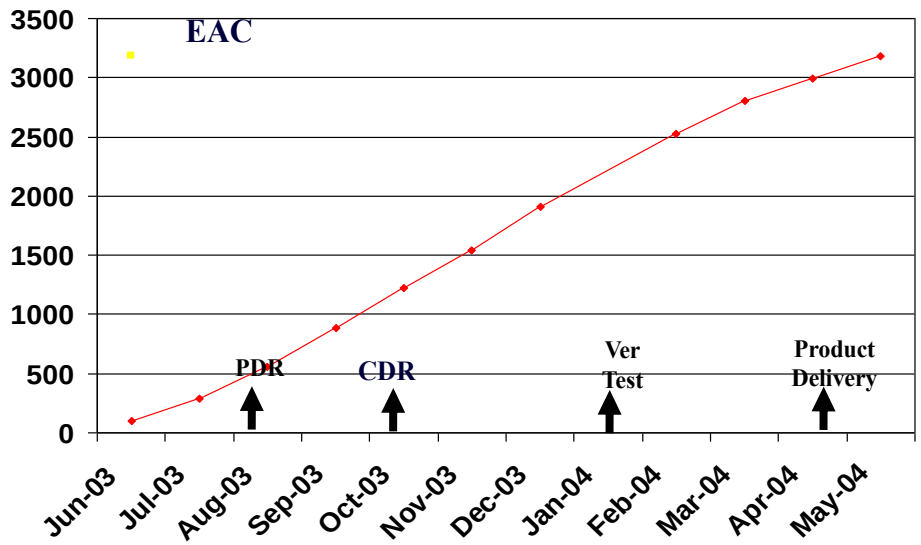
3

Time-phased Resources ($)



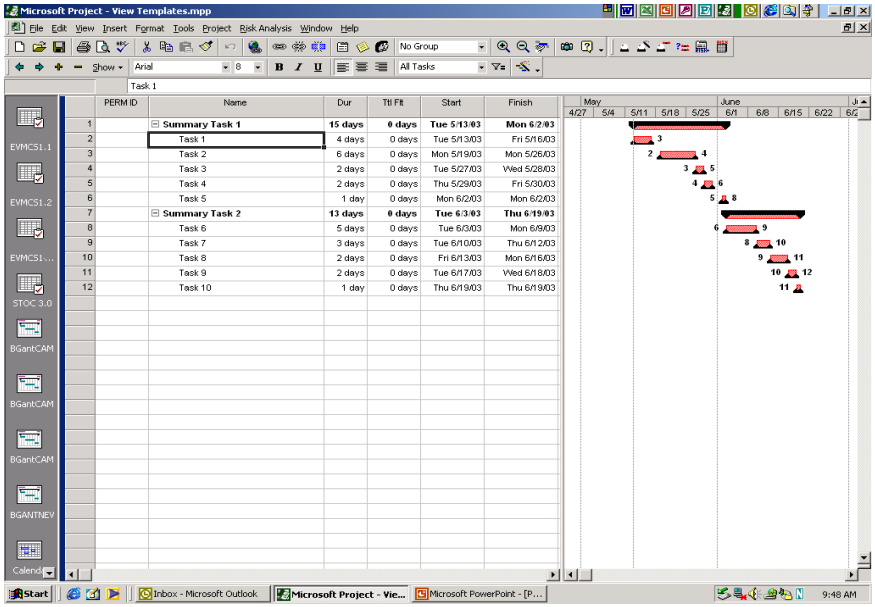
4

Time-Phased BCWS ($)



5

Schedule



6

Work/Planning Package Summary

Earned Value Method	BAC ($K)	% BAC
Milestone Weights	956	30%
0/100	637	20%
50/50	478	15%
Apportioned Effort	159	5%
Level of Effort	478	15%
Planning Packages	478	15%
Total	**3185**	**100%**

7

Subcontractor/Other Govt. Activities

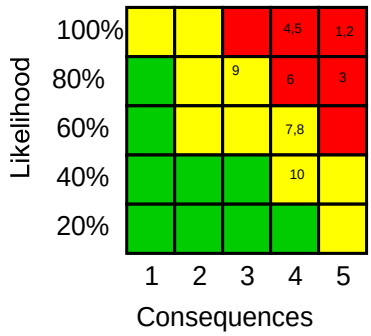
WBS	Subcontractor/Govt. Activity	Type	Cost ($K)
1100	Marshall Space Flight Center (MSFC)		50
2100	United Space Alliance (USA)	CPFF	200
3100	Boeing	CPIF	550
5100	Lockheed Martin	CPIF	30
5200	Johnson Space Center (JSC)		20
7100	ASRC	FFP	40
7200	Dynacs	FPIF	40
8000	Goddard Space Flight Center		50
Total Subcontracts/Government Activities			**980**

8

Top Risk List & Risk Matrix (Example)

Program/Project Name from date last review to date current review

Risk Matrix



Criticality	L X C Trend		Approach
High	⬇	Decreasing (Improving)	M - Mitigate
Med	⬆	Increasing (Worsening)	W - Watch
Low	➡	Unchanged	A - Accept
	New	New Since Last Period	R - Research

LXC Trend	Rank	Risk ID	Approach	Risk Title
⬇	1	Engine-01	M	Thermal Vacuum/Acoustic Test
➡	2	Engine-06	W	On-Orbit Propellant Transfer
⬇	3	Engine-03	M	Aggressive Schedule
⬆	4	Engine-08	M	Government Furnished Property (GFP)
New	5	Engine-05	M	Hot Fire Test Schedule Slip
➡	6	Engine-01	M	Design Launch Weight Exceeds the Shuttle Capacity
⬇	7	Engine-04	R	Returnability Requirement
⬆	8	Engine-09	W	12 Year Life Certification
New	9	Engine-07	M	Reboos Engine/Thruster Lives
New	10	Engine-15	M	Unachievable Thruster Technology

9

Executive Summary

Cost (Funding)	R
Cost (EAC)	Y
Schedule	G
Technical Performance	G
Risk	R
Management Issues:	Y

- **Contractor Transition**
- **Installation Process**
- **FR Upgrade**

10

Quantified Risk

Risk Title	Consequence	Likelihood Pocc	Cost ($K) Impact	Schedule Impact	Expected Value ($)
Thermal Vacuum/Acoustic Test	4	95%	300	13 wks	285
On-Orbit Propellant Transfer	4	90%	150	15 wks	135
Aggressive Schedule	5	80%	50	15 wks	40
Government Furnished Property (GFP)	4	85%	75	12 wks	63.75
Hot Fire Test Schedule Slip	4	90%	125	14 wks	112.5
Design Launch Weight Exceeds the Shuttle Capacity	4	80%	200	16 wks	160
Returnability Requirement	4	60%	250	15 wks	150
12 Year Life Certification	4	60%	225	12 wks	135
Reboos Engine/Thruster Lives	3	80%	150	7 wks	120
Unachievable Thruster Technology	4	40%	175	14 wks	70
Total Cost of Risks (Cumulative $K)			1700		
Total Cost of Risks Expected ($K)					1271.25
Reserve ($K)					3000

11

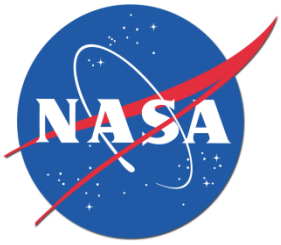
APPENDIX C PROPOSED IBR Language

Integrated Baseline Review (IBR): The contractor shall present its performance measurement baseline plan to the Government within six months after contract award, and subsequently, when required, following major changes to the baseline. The Government will verify during the IBR, and follow-on IBRs when required that the contractor has established and maintains a reliable performance measurement baseline. The contractor will ensure that the baseline includes the entire contract technical scope of work consistent with contract schedule requirements, and has adequate resources assigned. The contractor will assure the Government that effective earned value methods are used to accurately status contract cost, schedule, and technical performance. The contractor will perform a self-assessment of the cost and schedule risk for the IBR. The IBR will be used to achieve a mutual understanding of the baseline plan, cost and schedule risk, and the underlying management processes used for planning and controlling the project.

APPENDIX D RESPONSIBILITY ASSIGNMENT MATRIX

FLIGHT DEVELOPMENT PROJECT				CAM	BAC ($K)
1	**Flight Development Project**				**72300**
1.1		**Project Management**		CAM 1	**5000**
1.1.1					
1.1.2					
1.2		**Systems Engineering**		CAM 2	**3000**
1.2.1					
1.2.2					
1.3		**Science/Technology**		CAM 3	**2000**
1.3.1					
1.3.2					
1.4		**Safety and Mission Assurance**		CAM 4	**500**
1.4.1					
1.4.2					
1.5		**Payload (s)**			**5000**
1.5.1				CAM 5	1000
1.5.2				CAM 6	4000
1.6		**Aeronautical and Spacecraft Systems**			**12000**
1.6.1				CAM 7	2000
1.6.2				CAM 8	4000
1.6.3				CAM 9	6000
1.7		**Ground System(s)**			**18000**
1.7.1				CAM 10	2000
1.7.2				CAM 11	5000
1.7.3				CAM 12	3000
1.7.4				CAM 13	8000
1.8		**System Integration and Testing**			**5000**
1.8.1				CAM 14	2000
1.8.2				CAM 15	3000
1.9		**Launch Vehicle/Services**			**12000**
1.9.1				CAM 16	4000
1.9.2				CAM 17	3000
1.9.3				CAM 18	5000
1.10		**Mission Operations**			**9000**
1.10.1				CAM 19	2000
1.10.2				CAM 20	7000
1.11		**Education and Public Outreach**		CAM 21	**800**

APPENDIX E IBR NOTIFICATION LETTER TEMPLATE



<Project Name>

Notification of Integrated Baseline Review

Supplier: < Supplier Name>
Contract Number: <Contract #XXXXXXX>

Date: <Month Day, Year>

To: <Supplier Contract Officer Name, Organization>

SUBJECT: Notification of Integrated Baseline Review (IBR) and Request for Documentation for <Subproject Name or Contract #>.

It is the intent of the <Project Name> Project Office and the <Organization or Contractor> to use Earned Value as a tool in the management of <Subproject Name or Contract #>. In order to support this effort, a joint IBR will be conducted in accordance with this contract and current NASA requirements on <Date of on-site review>. Detailed scope of the IBR, including specific Control Accounts, will be determined at a later date.

The purpose of the review is to achieve a mutual understanding of the Performance Measurement Baseline and its relationship to the Earned Value Management systems and processes. The objectives are to gain insight into cost and schedule risk associated with the contracted effort and to establish confidence in the project's operating plans. This will be accomplished by jointly evaluating, through discussions with your Control Account Managers, the Performance Measurement Baseline to ensure it captures the entire technical scope, is consistent with contract schedule requirements and has an adequate resource plan. Discussions will focus on the scope of work, work authorization, scheduling, resource allocation and time phasing, and earned value techniques used to manage the work.

Enclosed is a list of documentation requirements that need to be submitted electronically for government review no later than <Date>. Forward all electronic submissions to <IBR Coordinator Name, Email>. The IBR team requires non-escort badges, a working area with tables and access to printers and telephones.

The IBR kick-off meeting is scheduled for <Date>. Meeting details will be sent separately. The IBR joint team training is scheduled for <Date>, <Organization or Contractor> personnel supporting or participating in the IBR are invited. The location is to be determined and will be provided prior to training.

<IBR Team Lead Name> will be the IBR Team Leader for this review. Questions concerning this notification or the IBR may be directed to <IBR Team Lead Name, Phone, Email> or <IBR Coordinator Name, Phone, Email>.

<PM NAME>
Project Manager
<Project Name> Project

Attachment 1: Documentation and Data Request
Attachment 2: Review Team On-site Requirements

Cc: Government COTR
Review Team Lead
Review Team Members

Documentation and Data Request

- Work Breakdown Structure (WBS) - to the Control Account level
- WBS Dictionary
- SOW with WBS cross-reference index
- Integrated Master Plan (IMP), if available, or key project milestones
- Project Risk Register
- Risk Management Plan
- Organizational Breakdown Structure (OBS) - to the CAM level
- Subcontractor listing by WBS element and value of subcontracts, if applicable
- Contractor/Subcontractor EVMS flow-down requirements
- Responsibility Assignment Matrix (RAM) showing dollars allocated by Control Account
- EVM System Description and related business process descriptions (e.g. Risk Management)
- Initial Control Account Plans (CAP), including Basis of Estimates (BOE), Assumptions, and Risks
- Latest Estimate at Completion (EAC) and supporting documentation
- Work Authorization Documents (all levels)
- Budget Change Requests (BCR) approved thus far, if applicable.
- Baseline Control Logs (Management Reserve, Undistributed Budget, Contract Budget Base)
- Integrated Master Schedule (IMS) with linkages to Integrated Master Plan (IMP)
- Supporting schedules (Intermediate, and Detailed, as applicable)
- All Contract Performance Reports (CPR) to date
- Financial Reports such as 533M/Q or equivalent
- Performance measurement reports used for internal management purposes
- Control Account/Work Package summary showing:
 - Number of work packages and total value by type of EV method
 - Longest CA, shortest CA, mean and median duration, total value of account
 - Largest CA, smallest CA, mean and median values- Number of Planning packages and total Planning Package budget
- All contract changes to date

Instruction TO BE DELETED:
(The above list is intended to be a comprehensive example of the final list. This list should be tailored based on information required for preparation and insight. The supplier may have the data described above in different formats or naming conventions. Only request data that has not already been received. Documentation should be requested to be received NO LATER THAN 2 - 4 weeks prior to the IBR.)

Review Team On-site Requirements

A certain amount of administration is required to ensure the smooth IBR. This effort will benefit all stakeholders. The project is requested to arrange the following for our Review Team's on-site presence during the review:

1. All Review Team members are cleared for any security requirements, and that arrangements are in place for them to be collected and escorted in necessary while on site.
2. Provide adequate working area and collaborative work space.
3. Schedules for discussions with CAMs and other project management staff and ensure all personnel are available.
4. Ensure that rooms for CAM discussion are available.
5. Administrative support as required.

APPENDIX F IBR GUIDANCE PACKAGE

INTEGRATED BASELINE REVIEW

GUIDANCE PACKAGE

<PROJECT LOGO>

<PROJECT NAME>

<SUPPLIER NAME>
<SUPPLIER ADDRESS>
<IBR DATES>

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PURPOSE

The purpose of the IBR is to achieve a mutual understanding of the baseline plan and its relationship to the underlying Earned Value Management (EVM) systems and processes that will operate during the life cycle of the project. The objectives are to gain insight into cost, schedule, technical, resource, and management process risk areas, as well as develop confidence in the project's operating plans. This will be accomplished by evaluating the performance measurement baseline to ensure it captures the entire technical scope of work, is consistent with schedule requirements, has adequate resources assigned, and has sound management processes.

PROJECT BACKGROUND

<Short description of the project and the supplier's role>

REVIEW METHODOLOGY

The IBR process will include the activities listed below.

a. A review of the documentation that establishes the current and baseline plan will occur prior to and during the IBR. This will include technical scope, cost estimate to complete (ETC's), basis of estimates, budgets, resource plans, schedules, and earned value methods. Concern area reports will be generated and submitted as a result of pre-IBR and IBR reviews.

b. IBR training to familiarize the review team with the IBR process, purpose, and documentation.

c. Discussions with selected managers to verify the adequacy and risk related to work authorizations, budgets, ETC's, current and baseline schedules.

e. Sub-team evaluations, risk assessments, and preparation of concern area reports required. Team meetings to discuss results of the control account manager discussions.

f. An out briefing by the Team Leader covering the results and findings of the review. The Sub-team Leaders will also be available at the out brief for questions and comments.

SAMPLE REVIEW AGENDA

Day 1

8:00- 10:00	IBR In-brief, Administrative Details
10:00- 11:30	Documentation Review
11:30-12:30	Lunch
12:30- 2:30	Discussion Period 1
2:30- 3:30	Period 1 Wrap up
3:30- 5:00	Sub-Team Out-Briefs

Day 2

8:30-10:30	Discussion Period 2
10:30-11:30	Period 2 Wrap up
11:30-12:30	Lunch
12:30-2:30	Discussion Period 3
2:30-3:30	Period 3 Wrap up
3:30-5:00	Sub-Team Out-Briefs

Day 3

8:00 -10:00	Discussion Period 4
10:00-10:30	Period 4 Wrap up
10:30-11:30	Out-brief Preparation
11:30-12:30	Lunch
12:30-3:00	IBR Out-Brief & Closing Statements

SAMPLE IBR QUESTIONS

(USE AS GUIDELINE FOR DISCUSSION PREPARATION)

The list of sample questions below should serve as a guide to the IBR Team, and does not represent a comprehensive list. It is not the intent for the IBR Team to ask each of these questions during the CAM discussions. The IBR Team can review the questions below and select the areas relevant to each CAM discussion.

ORGANIZATION

What is the manager's scope?

> The manager should be able to refer to a Statement of Work (SOW) paragraph, a Contract Work Breakdown Structure (CWBS), or WBS narrative, and a Work Authorization Document.

How many people work for you and what do they do?

How do they report to you (how do you know the performance status of their work)?

How did the manager plan the work into control accounts?

> The SOW defines the effort. The WBS or CWBS provides specifics, such as work definition. The work authorization and change documentation should show information such as the dollars/hours, period of performance, and description of the scope of work and any changes.

How did the manager ensure that all elements of the scope are planned?

> The manager should be able to show the scope of work broken down into work packages, planning packages, or summary level planning packages and the budgets and ETC's associated with each. The sum of the work packages and planning packages should equal the control account budget. The actual costs plus the ETC's should equal the Estimate at Completion.

How did the manager obtain the resources for assigned work?

> Baseline resources should be identified in the work authorization document and changes in scope, cost or schedule requirements should be reflected in change request documentation.

What process did the manager use to develop the resources required to accomplish the current plan and how does this differ from the original plan?

Review the basis of estimate for reasonableness.

Does the manager believe that the budget or ETC is sufficient to perform the work? Ask the Manager to describe the resource requirement development process.

What is the current EAC?

How was the EAC developed?

Who reviews updates to the EAC?

Does the EAC require program manager approval?

How does the EAC compare to the BAC?

Note: The cost estimate to complete (ETC) should be reviewed monthly by the CAM.

Elicit a range of possibilities (low and high) that represents as clearly as possible the complete judgment of the CAM as follows:

Ask the CAM the basis of estimate (i.e., results from previous projects, etc.). Does the estimate consider past performance and does the EAC reflect the current cost performance trend?

Identify risks/opportunities that are included/not included in the baseline.

What are the major risks or challenges remaining to accomplish the CAM's or subcontractor's responsibilities?

Ask the CAM to describe why it is a risk or opportunity.

Exchange ideas about risks or opportunities.

Establish the likelihood of the risk/opportunity event.

Ask the CAM to explain the risk mitigation plan emphasizing risk mitigation milestones and associated risk performance measurement.

Determine the impact (cost/schedule) for medium and high risks.

Ask the CAM to consider extreme values for his effort (optimistic/pessimistic).

Document results on the Risk Assessment Form

AUTHORIZATION

How are you authorized to begin work? (Provide an example of work authorization documentation.)

Show me your work authorization document(s), which define the work you must accomplish and relate these requirements to the work remaining within your team/WBS element at the time the cost to complete, was analyzed/developed.

BUDGET

What role did you play in formulating the budget?

How did you arrive at your budget figures? Do you have the backup or worksheets from which you arrived at your estimates?

Was there a negotiation process for your budgets? Is your budget adequate?

How were you advised of budget? Of tasks? Of schedule? Of changes?

CONTROL ACCOUNT

How many control accounts are you responsible for and what is the total dollar value of your accounts? May we see a control account plan?

How are your budgets time-phased, and is this reflected in your control account plan?

How do you status your accounts? How does the performance status of your accounts get into the system?

Do you have any LOE accounts? Please describe the tasks of these accounts.

Do you have any control accounts that contain a mixture of LOE and discrete effort? What is the highest percentage of LOE within an account that also contains discrete effort?

How do you open a control account?

How do you close a control account?

How can you tell when a control account is opened or closed?

What reports do you receive that give you cost and schedule progress of your control accounts?

WORK PACKAGE

What percent of your work is measured or discrete effort? What percent is Level of Effort (LOE)?

How does your work package relate to the CWBS or WBS? Please discuss with actual examples.

How are your work package activities related to the Integrated Master Schedule or underlying intermediate supporting schedules? Actual examples will support this discussion.

How was the budget time-phased for each work package, i.e., what was the basis for the spread? Is the time-phased budget related to planned activities of the work package?

For the example control account, what is your total budget amount? Of this total budget amount, how much is distributed to work packages and how much is retained in planning packages? Do you have an undistributed budget or management reserve account?

Do you use interim milestones on any of your work packages to measure BCWP?

How do you define a work package? What is the difference between a work package and a planning package?

How many work packages do you have responsibility for?

What options does your management system provide for taking BCWP?

Do your control account plans indicate the method used in taking BCWP?

How do you know when a work package is opened or closed?

Have you ever opened work packages earlier than the scheduled start date? If so, how is this accomplished?

Who prepares the budgets for your work packages?

Demonstrate how you earn BCWP in the same way that BCWS was planned?

Can you provide examples of how you measure BCWP or earned value for work-in-process?

Does anyone review labor hours charged to your work packages?

Do you ever have mischarges to your work packages? How are these corrected?

PLANNING PACKAGE

What is the procedure and time frame for discretely developing work packages from the planning packages?

Are your planning packages time-phased?

SCHEDULE

What are your schedule responsibilities?

What schedule milestones did the manager use in planning the control account(s)? Ask the Manager to show the team the schedule milestones used in the planning of the control accounts. How does the current schedule compare with the baseline schedule?

The manager should discuss:

Relationships of work packages to milestones.
Schedule interfaces and constraints.
Resource levels to support schedule milestones.
Relationships to other organizations.
Schedule impacts related to other work/organizations.
Level of Effort tasks that support the schedule.

How did the manager time-phase the work to achieve the schedule? All work should be logically planned in compliance with the SOW and schedule.

Has the manager considered risks in developing the plan?

Has the manager adequately planned and time-phased resources to meet the plan?

Do you directly support any major master or intermediate schedule milestones?

Do you have detailed schedules below the work package?

How do detailed schedules below the work package support the work package schedules?

How are you informed by other organizations of changes in their output that may affect your control accounts schedules? (Horizontal Trace)

Demonstrate that the progress reflected on the master project schedule or underlying intermediate schedules correlates to the relative progress reflected in the EVM system.

CHANGE CONTROL

Have you had retroactive changes and/or replanning efforts to the budget baseline?

Have you had any changes to your accounts? (Provide example of how these are handled.)

Are budget transfers between your accounts and management reserve and undistributed budget traceable? How?

Do you have any work originally planned for in-house that was off-loaded? How was this accomplished?

For off-loaded work, was the budget transferred directly, returned to management reserve, or to undistributed budget?

EARNED VALUE

Is progress toward accomplishing identified and planned activities used to determine earned value? If yes, describe the process. If no, how is earned value assessed?

What type(s) of earned value measurement indicators have been assigned by the manager?

> Is the earned value method chosen appropriate for the type of work being performed?
>
> Does the method chosen objectively measure performance?
>
> Does the earned value assessment correlate with technical achievement?

What methods and tools does the manager use in administering the plan?

> Some examples are weekly or monthly earned value reports; master, intermediate, and detail schedules; periodic meetings; independent assessments of technical progress, etc.

Determine how changes are incorporated. Evaluate the effect of changes on performance measurement information. Assess whether changes are done in accordance with the EVM system description or documented management processes.

What formal training have you had in EVM?

Do you feel you have had adequate training or do you need more?

ESTIMATE AT COMPLETION (EAC) / COST-TO-COMPLETE (CTC)

What does Estimate at Completion (EAC) mean to you? How do you arrive at an EAC?

How often is your EAC reviewed and revised?

What guidance or instructions did you receive from management in order to develop your EAC?

If written instructions were provided, what were these and who authored them?

Define the work remaining within your WBS element at the time the cost to complete was analyzed/developed. Identify effort to be performed by major subcontractors.

How did you determine the effort or resource amounts required to complete the remaining work?

- Outline the steps you took to arrive at your estimate.
- What project/performance risks have been considered in your estimate?
- What performance level was assumed and why?
- How does the projected performance level compare to your experienced level of performance?
- How are EAC's calculated for material?

Demonstrate that your EAC is segregated by labor, material, and other direct charge categories.

What current and future events and performance factors have been included in your current cost to complete? Examples: task changes, make-buy decisions, performance factors, etc.

Describe and demonstrate how you projected the cost to complete over the time remaining.

Discuss your management's involvement in developing the estimate of the cost remaining to complete your program tasks.

SUBCONTRACTOR/EXTERNAL WORK

Are you responsible for any subcontracts? How do you monitor performance on these? How do you take BCWP?

How are subcontracts managed? Ask the Subcontracts Manager to describe the process for managing subcontractor earned value.

What subcontracts are your responsibility? What criteria determine whether a subcontract or a Purchase Order is used? What types of subcontracts exist or plan to be negotiated (fixed price vs. cost plus)?

What are the major challenges or risks to the subcontractor in accomplishing project responsibilities?

Are these items tracked by the Project Management Office or Functional Manager in a risk register or plan?

What subcontractor technical, schedule and cost reports are required to be submitted to you or your team?

What is your total budget (for each subcontract and the corresponding control accounts)? How is profit or fee included in your budget?

How was the budget established? Does it reflect an achievable value for the resources to fully accomplish the control account scope of effort?

What rationale was used to time phase the budget into planning packages, tasks, work packages or summary activities?

Are the time phased budget resources consistent with your integrated master schedule? Show the trace from your control account to intermediate or master schedules.

When are you required to detail plan planning packages or summary activities? What schedule document or system is used to develop detail planning for your control account?

How do you know that the work within your control accounts to be performed by subcontractor has been properly planned?

How do you check the status and performance of work on your control account by a subcontractor?
How are actual costs recorded against your control account?

What techniques are available for determining Earned Value? Explain the application of each technique.

How and when is risk assessment or risk management plan updated for technical/schedule/cost risk items affecting your control account?

How and when is the actual and forecast schedule update provided for your control account effort?

Are variance analysis thresholds or requirements established for reporting technical, schedule or cost variances to planned goals established for your control accounts? Do you informally/formally report the cause of variance, impact or corrective action for these variances?

What is your current Estimated Cost at Completion (EAC)? How often is it updated? Does your EAC reflect current cost performance trend?

What document authorizes you to begin work on a subcontract?

For these selected work packages, what specific outputs, products, or objectives are to be accomplished?

What is specifically needed by you from other control account managers to generate subcontractor outputs or products? How do you monitor its progress?

Who specifically needs the subcontractor outputs or products to perform their program functions? How do you status others on the progress of your outputs to them?

Specifically, what technical items are currently producing the greatest risk to achieving technical, schedule or cost goals? Are these items reviewed as part of a risk assessment, management plan or other reporting tool to your boss or the project management office?

How do you determine whether the reported cost variance is due to subcontractor effort or a company overhead rate?
How are material budgets planned?

How do you track material prior to delivery?

How do you track material when deliveries are late?

When is BCWP or earned value taken on material?

How much BCWP is earned when material is withdrawn from inventory or received?

ANALYSIS

Do you have any variance thresholds of your control accounts?

What are the variance thresholds of your control accounts?

How do you know when you have exceeded a threshold?

How do rate changes affect your control accounts?

Who is responsible for rate variance analysis?

Will an account accept BCWP or ACWP if there is no BCWS?

How do you know when you must prepare a variance report?

Do you have samples of any variance analysis reports? (Do these show a statement of problem, the variance, cause, impact and proposed corrective action?)

Who receives your variance reports? What action is taken on the reports?

Which reports do you use most frequently? Why?

OTHER

How are you reporting labor, material, and other direct costs?

Has your effort been impacted by any directed or contractual change? When did you receive authorization to proceed with the change and how did you incorporate the change in your plan (schedule and budget time phasing)?

What changes have been made to the control account planning (technical definition of scope, schedule, budget resources, ETC's)?

- What documents are involved in a change to the control accounts' scope of work, schedule, budget, or ETC?
- Did the CAM re-phase or replan work? In process work? Completed work? Unopened work packages? Make current period or retroactive changes?
- Did the CAM transfer budget between control accounts?
- How have contract changes or other changes been incorporated into the control account?
- If one of the control accounts had an unfavorable cost or schedule variance did the CAM replan or request management reserve to reduce or eliminate the variance?

DISCUSSION GUIDELINES

LOCATION OF DISCUSSION

Conference Rooms will be provided by the supplier for the on-site review.

STRUCTURING THE DISCUSSION

- Have an objective. What is the purpose for speaking with this particular manager? What do you expect to gain from the discussion?
- What questions will you ask to achieve the objective?
- Prepare a tentative list of basic questions to serve as a framework for the discussion. This will open the way for spontaneous in-depth conversation and follow-up questions.
- Designate a person to take notes

THE DISCUSSION PROCESS

Below is a list of suggested techniques for all team members to consider before and during the CAM discussions.

- Prior to the discussions, the IBR Team members should be familiar with areas previously identified for discussion. Review the documentation thoroughly.
- Introduce yourself and identify the organization you represent. You may also wish to indicate your team affiliation in the review.
- Be well prepared and maintain a tempo that keeps the discussion moving along toward satisfying your objective. Be friendly, but avoid long conversations extraneous to the discussion.
- Take notes. The discussion leader (normally the Sub-team Technical Lead) or an accompanying team member should take notes during the discussion.
- Request copies of documents only if necessary to accomplish the objective of the discussion. If documentation is not readily available, complete a

Documentation Request Form. See Appendix F for a sample Documentation Request Form.

- Watch the time. Discussions are normally scheduled for two hours in length. Should additional time be required to complete the discussion, coordinate with the Team Leader

- If disagreements arise which cannot be resolved, the team member should write a description of the disagreement in a Concern Area Report and submit it to the Team Leader for disposition. The Team Leader will handle any continuing discussion with the Project Team.

AFTER THE DISCUSSION

Complete the written discussion assessment form directly after the discussion. Use this as a reference during the daily Government team meetings. Submit the forms and all concern area reports to the IBR Coordinator.

Be sure to follow up on any outstanding issues or questions, especially if you address them in your discussion assessment forms, or if you have committed to obtaining additional information in support of your assessments. Do not leave any loose ends.

TEAM ASSESSMENTS:

The following provides additional guidance for assessing the adequacy of the scope, schedules, resource plans, and earned value methods.

a. **Technical Scope**: Evaluate the technical content described by the CAM and compare that to the definitions provided in the CWBS or WBS Dictionary, control accounts, and work packages. Ensure that the work scope described is consistent with the Statement of Work and specifications and that it is clear, sufficiently detailed, well understood, and complete. Ask the CAM if there is any planned effort that is not included or fully identified in the documentation.

b. **Schedules**: Examine the detailed, intermediate, and master schedules. The scheduled milestones and activities reflected in the work packages and control account plans should be consistent with intermediate schedules and project milestones. The sequence of planned activities/events should be logical. Time frames allocated to accomplish these schedules should be reasonable. To the extent practicable, schedules should identify the

significant task interdependencies needed to meet the requirements of the project. Significant decision points, constraints, and interfaces should be identified as key milestones. Ask the CAM to identify any known risks or barriers in meeting the schedules.

c. **Resource Plan**: Determine the adequacy of the amount and time-phasing of hours, materials, and other required resources planned to accomplish the work identified in control accounts, work packages, and planning packages. The basis of estimate should be reasonable. Determine whether the supplier has or anticipates potential difficulties in obtaining or using the required resources to accomplish the work. Ask the CAM to identify any known risks in meeting the plan.

d. **Earned Value Methods**: Be familiar with the supplier's earned value methods. Ask the CAM why a particular type of earned value method was chosen. Determine whether the supplier is using the best method for the identified type of work. There should be a meaningful correlation between technical achievement and cost and schedule control. Ask the CAM how he or she ensures that measurable earned value assessments correlate with technical achievement. Ensure that earned value methods and assessments are as objective as possible, that the assessments represent actual technical progress, and that a reasonable quantitative approach exists to assess technical status.

DOCUMENTATION GUIDELINES

Each Sub-Team Leader is responsible for documenting the sub team's assessments and findings. The Team Leader uses the documentation to support overall team assessments and required corrective actions.

The following forms have been developed to facilitate review documentation.

a. **Discussion Assessment Form**: The Team/Sub-team should complete one of these forms after each discussion. The Team/Sub-team Technical Leader is responsible for reviewing this form and submitting it to the Team Leader. Concerns noted should be documented in the Concern Area Report (CAR). Keep in mind that the Discussion Assessment Form can be tailored based on risks associated with the project.

b. **Concern Area Report (CAR)**: A CAR should be completed for each concern noted. Generally, concerns noted are items that require follow-up action. Information on this form should be clear and as specific as possible because it will be provided to the supplier to obtain a response and resolution. Spell out abbreviations. These forms should be submitted immediately to the Team Leader, and as soon as practical to the supplier. Responses should be provided to the team as soon as possible. Again, the Team/Sub-team Leader is responsible for reviewing this form, and submitting it to the Team Leader. All forms will be compiled and logged.

c. **Documentation Request Form**: During your discussions, you may find that you require additional documentation to gain a better understanding of the issue in question. Use the form to obtain required documentation. Submit the completed form to the Team Leader. All forms will be tracked in order to reduce redundancies and ensure receipt of all the requested material.

d. **Risk Assessment Form**: A risk assessment form should be completed after each discussion. Each risk and opportunity identified during the CAM Discussion is assigned a probability of occurrence. A potential cost and schedule impact for each risk and opportunity should be estimated, and a determination made as to whether this risk has been accounted for in the baseline. Each risk is classified as cost, schedule, technical, resource, or management process and assigned a rating based on risk evaluation criteria established by the NASA PM prior to the IBR. The ultimate goal of the Risk Assessment area of the IBR is an updated Estimate At Complete (EAC) or Life Cycle Cost Estimate (LCCE) which incorporates quantified risks. The Team/Sub-team Leader is responsible for

reviewing this form and submitting it to the Team Leader. Risks identified at the IBR should be incorporated into the project's existing risk management plan. This is just a sample. If your program or project has a specific risk management process, be sure to use that methodology. For Constellation Program IBR's, see Appendix P of the CxP Candidate Risk Assessment Form and the CxP IBR Management Guide for risk evaluation criteria and guidance.

e. **General Assessment Form:** The form is used to document observations for those things that are "not CAR worthy", but might help EVM efficiencies (such as automatic links between IMS and EVM engine), as well as potential problem areas in the future based on previous IBR lessons learned. It is also used to document "best practices" for those things that improve the EVM process.

IBR DISCUSSION ASSESSMENT FORM

LOG# _____ Team_____ Date: _____

Manager:_____ Area of Responsibility: _____

2. TECHNICAL SCOPE (Statement of Work):
 - _____ Is there adequate identification, definition, and flow down?
 - _____ Consistent with contract requirements?
 - _____ Adequate assignment of responsibility, authority & accountability?

2. SCHEDULES Period of Performance: _____
 - _____ Realistic planned durations?
 - _____ Logical sequence of work planned?
 - _____ Consistent with intermediate/master schedule?
 - _____ Significant interdependencies, interfaces, & constraints?
 - _____ Support contract milestones?

3. COST AND RESOURCE RISK
 - _____ Sound basis of estimate?
 - _____ Budget reasonableness (time phasing, levels, mix, type)?
 - _____ Budget adequacy (time phasing, levels, mix, type)?
 - _____ Resource availability?
 - _____ Adequate budget/etc values assigned?
 - _____ Provisions for scrap, rework, retest or repair?

4. MANAGEMENT PROCESS RISK
 - _____ Integrated cost/schedule/technical planning?
 - _____ Baseline change control?
 - _____ Accurate and timely management/performance data?
 - _____ Adequate determination and maintenance of EAC's?
 - _____ Adequate subcontract management?
 - _____ Risk management process documents risk associated with the PMB?
 - _____ Appropriate planned earned value methods?
 - _____ Objective determination of progress?
 - _____ Methods correlate with technical achievement?

5. Brief Summary of Discussion

6. Concern Area Report (CAR) prepared?

IBR CONCERN AREA REPORT

WBS / CA _____ Log #_____

Date: _____

Submitted by: _____

Subject of Finding:

Discussion (Explain root problem and cause. Provide impact assessment. Quantify problem and impacts where possible. Provide recommended actions and exit criteria for resolution. Attach exhibits if applicable. Provide reference to control account or work package number).

Supplier's response (Address root cause of the problem, impact, corrective/preventative action plan; identify dates and POC. Identify exit criteria for corrective action).

Sub-team leader signature: _____

Team leader signature: _____

DOCUMENTATION REQUEST FORM

Log #: _____ Sub-Team_____

Date: _____

Submitted by:

1. Responsible Manager:

 Control Account(s):

 Area(s) of Responsibility:

2. Document Description or Type.

3. Reason for Request:

4. Remarks/Comments:

Sub-team Leader Signature: _____

Team Leader Signature: _____

RISK EVALUATION CRITERIA

The IBR Discussion Evaluation Summary form and IBR Out Brief need all 5 types of risks for an IBR: Risks can generally be categorized into the following five areas: technical, schedule, cost, resource, and management processes. The following are brief discussions of each of the types of risk.

Technical Risk - The ability of the project's technical plan to achieve the objectives of the scope of work. Technical risk includes the effects of available technology, software development capability, design maturity, etc.

Schedule Risk - The adequacy of the time allocated for performing the defined tasks to successfully achieve the project schedule objectives. Schedule risk includes the effects on the schedule of the interdependency of scheduled activities to achieve project milestones and support the PMs' ability to identify and maintain the critical path.

Cost Risk - The ability of the PMB to successfully execute the project and attain cost objectives, recognizing the relationship between budget, resources, funding, schedule, and scope of work. The quality of the estimates affects the cost risk, which includes the assumptions used for both estimates and resource allocation on the budgets for work items.

Resource Risk - The availability of personnel, facilities, and equipment, when required, to perform the defined tasks needed to execute the program successfully. Resource risk includes the effect of external factors such as loss of availability to competing programs or unexpected downtime that could preclude or otherwise limit the availability of the resources needed to complete planned work.

Management Processes Risk - The degree to which the management processes provide effective and integrated technical/schedule/cost planning and baseline change control. Management processes risk includes the ability to establish and maintain valid, accurate, and timely performance data, including data from subcontractors, for early visibility into risks.

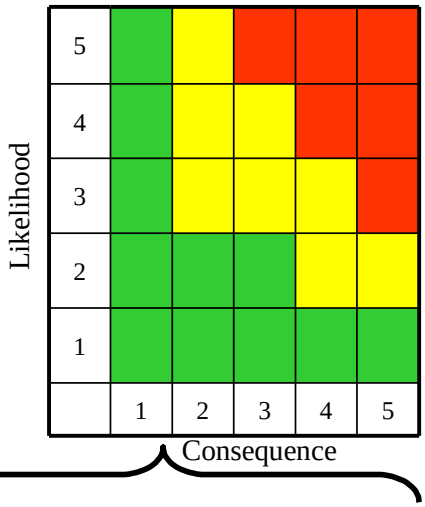
The following paragraphs and one chart explain the criteria for evaluating the five risks described above.

Sample Technical, Schedule, Cost, Resource, and Management Process Risk – Evaluation Criteria:

Project Risk Analysis

Likelihood

What is the **likelihood** the risk will happen?		
Lvl	Likelihood	Planned approach and processes
1	Not likely	Will effectively avoid or mitigate this risk based on standard practices
2	Low likelihood	Have usually mitigated this type of risk with minimal oversight in similar cases
3	Likely	May mitigate this risk, but workarounds will be required
4	Highly likely	Cannot mitigate this risk, but a different approach might
5	Near certainty	Cannot mitigate this type of risk, no known processes or workarounds are available



Consequence

Given the risk is realized, what would be the magnitude of the impact?			
Lvl	Technical	Schedule	Cost
1	Minimal or no impact	Minimal or no impact	Minimal or no impact
2	Minor performance shortfall, same approach retained	Additional activities required, able to meet key dates	Budget increase or unit production cost increase <1%
3	Moderate performance shortfall, but workarounds available	Minor schedule slip, will miss need date	Budget increase or unit production cost increase <5%
4	Unacceptable, but workarounds available	Program critical path affected	Budget increase or unit production cost increase <10%
5	Unacceptable, no alternatives exist	Cannot achieve key program milestone	Budget increase or unit production cost increase >10%

Resource Risk - Evaluation Criteria:

Excellent (Green) – Has little potential to cause disruption of schedule, increased cost, or degradation of performance. Normal supplier effort and normal Government monitoring will probably be able to overcome difficulties.

Adequate (Yellow) – Can potentially cause some disruption of schedule, increased cost, or degradation of performance. Special supplier emphasis and close Government monitoring will probably be able to overcome difficulties.

Poor (Red) – Likely to cause a significant disruption of schedule, increased cost, or degradation of performance. Risk may be unacceptable even with supplier or emphasis and close Government monitoring.

Management Processes Risk - Evaluation Criteria:

Excellent (Green) - Processes are in place for Baseline Maintenance, Risk Management, Scheduling, Estimate At Completion updates, Subcontract Management and Managerial Analysis. Earned value methods are appropriate, provide objective determination of progress, and correlate with technical achievement. These processes are formally documented and are being used to manage the program. Few issues have been identified with the processes or how they are being applied. Management processes will provide timely and accurate performance data. Has little potential to cause disruption of schedule, increased cost, or degradation of performance. Normal supplier effort and normal Government monitoring will probably be able to overcome difficulties.

Adequate (Yellow) – Most, but not all, processes are in place for Baseline Maintenance, Risk Management, Scheduling, Estimate At Completion updates, Subcontract Management and Managerial Analysis. Earned value methods could be more objective and correlate more closely with technical achievement. Some processes are not fully documented. Discussions indicate that the Control Account Managers area not correctly using the management processes. There are concerns that the management processes may hinder timely and accurate performance data. Can potentially cause some disruption of schedule, increased cost, or degradation of performance. Special supplier emphasis and close Government monitoring will probably be able to overcome difficulties.

Poor (Red) – Few management processes are in place for Baseline Maintenance, Risk Management, Scheduling, Estimate At Completion updates, Subcontract Management, and Managerial Analysis. Earned value methods are subjective and do not correlate with technical achievement. Processes are not documented. Discussions indicate that the Control Account Managers are not using the management processes There are concerns that the management processes will prevent accurate and timely performance data. Likely to cause a significant disruption of schedule, increased cost, or degradation of performance. Risk may be unacceptable even with supplier emphasis and close Government

A format for assessment by process area is shown below and may be a helpful tool to the team in characterizing and consolidating management process

findings. This format can also be used to support the IBR Findings Letter or IBR Report.

Management Process Area	Deficiency				
	Low	Moderate	High	No Deficiencies	Best Practice
Organization					
Work Authorization					
Scheduling					
Budgeting					
Status/Updates					
Management Analysis					
Change Control					
EAC and Risk Management					
Accounting					
Indirect Management					
Material Management					
Contract/Subcontract Management					
Training					
Total					

	Low (No CAR)
	Moderate (Could warrant a CAR)
	High (Should have corresponding CAR)
	No Deficiencies
	Best Practice

IBR RISK ASSESSMENT

Sub-Team:_____ Date: _____

Control Account: _____ WBS ID: _____

Risk/Opportunity Description	Probability of Occurrence	Cost Impact	Schedule Impact	In Baseline? (Y/N)	Risk Type	Risk Rating (R/Y/G) (H/M/L)

GENERAL ASSESSMENT FORM

<table>
<tr><td rowspan="4">General Assessment: Is intended to document observations for those things that are “not CAR worthy”, but might help EVM efficiencies (such as automatic links between IMS and EVM engine), as well as potential problem areas in the future based on previous IBR lessons learned. It is also used to document “best practices” for those things that improve the EVM process.</td><td>Date:</td></tr>
<tr><td>Assessment:</td></tr>
<tr><td>Technical (Yes or No):</td></tr>
<tr><td>Cost (Yes or No):</td></tr>
<tr><td colspan="2">Schedule (Yes or No):</td></tr>
<tr><td colspan="2">Owning Organization:</td></tr>
<tr><td colspan="2">Condition Statement: Is a phrase briefly describing current key circumstances, situations, etc. that are “not CAR worthy”, but might help EVM efficiencies.</td></tr>
<tr><td colspan="2">Action Statement: Is a phrase briefly describing the appropriate actions required.</td></tr>
<tr><td colspan="2">Best Practices: Is a phrase briefly describing the “best practices”.</td></tr>
<tr><td colspan="2">IBR Team Member Signature:_____
Print Name:_____</td></tr>
<tr><td colspan="2">IBR Team/Sub-team Lead Signature:_____
Print Name:_____</td></tr>
<tr><td colspan="2">IBR Risk Management Officer Signature:_____
Print Name:_____</td></tr>
</table>

GLOSSARY OF EVM TERMS

For the in-house portion of a project, use the NASA financial Management Requirements (FMR) document for definitions of Center G&A, corporate G&A, Direct Costs, G&A, Indirect Cost, Service Pools, and Service Pool costs

Actual Cost of Work Performed (ACWP) (or Actual Costs). The costs actually incurred and recorded in accomplishing the work performed within a given time period. Actual costs include the direct cost plus the related indirect cost such as overhead, G&A, etc. allocated to the activity.

Apportioned Effort. Effort which by itself is not readily divisible into short-span work packages but which is related in direct proportion to some other measured effort.

Authorized Unpriced Work. Any effort for which contractually definitized costs have not agreed upon, but for which written authorization has been received.

Authorized Work. Effort which has been definitized and is on contract, plus that effort for which definitized contract costs have not been agreed to but for which written authorization has been received.

Baseline. See "Performance Measurement Baseline."

Bottoms–Up Cost Estimate. An estimate derived by summing detailed cost estimates of the individual work packages and adding estimated level of effort plus appropriate indirect cost estimates. Frequently accomplished as an independent analysis by Industrial Engineering, Price Analysis and Cost Accounting.

Budget. A plan of operations for a fiscal period in terms of estimated costs or hours.

Budget At Completion (BAC). The sum of all budgets (BCWS) allocated to the project or a given Control Account. It is synonymous with the term Performance Measurement Baseline.

Budgeted Cost For Work Performed (BCWP) (or Earned Value). The sum of budgets for completed work packages and partially completed work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort work packages.

Budgeted Cost For Work Scheduled (BCWS) (or Planned Value). The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period. This is the value of planned work.

Budgeting. The process of translating approved resource requirements into a time-phased plan for accomplishing work.

Change Order. A formal revision or change to a contract or project that may impact the scope of work, schedule, cost, price, and/or other requirements.

Contract Budget Base (CBB). The negotiated contract cost plus the estimated cost of authorized but unpriced work. It includes the PMB and MR. Customer approval is generally required to change it.

Contract Performance Report (CPR). A contractually required recurring report designed to provide information on contract cost performance status, problems, and corrective actions (DI-MGMT-81466).

Contracting Officer's Technical Representative (COTR). Person responsible for the contractor's performance on a given contract.

Control Account (CA). A management control point at which budgets (resource plans) and actual costs are accumulated and compared to the earned value for management control purposes. A control account is a natural measurement point for planning and control since it represents the work assigned to one responsible organizational element (or integrated product team) for a single Work Breakdown Structure (WBS) element.

Control Account Manager (CAM). A manager responsible for task performance of a Control Account and for planning and managing the resources authorized to accomplish such task.

Cost-At-Completion (CAC). Actual direct costs, plus indirect costs, plus the estimate of costs (direct and indirect) for authorized work remaining. The CAC is sometimes referred to as Estimate-at-Completion (EAC) or Latest Revised Estimate (LRE).

Cost Element. Typical elements of cost are: direct labor, direct material, other direct costs, and indirect cost (overhead).

Cost Performance Index (CPI). A measure of cost efficiency. It compares BCWP to the actual cost to perform that work (CPI=BCWP/ACWP). An index of 1.0 means that we are spending exactly what we planned to spend to accomplish the work performed. CPI > 1.0 means we are under running costs. CPI < 1.0 means that we are over running costs.

Cost Plus Award Fee/Fixed Fee/Incentive Fee. Cost reimbursement contract types where the fee is based upon: (a) the accomplishment of pre-negotiated goals (Award Fee); (b) a negotiated fixed fee amount (Fixed Fee); or (c) a risk sharing ratio within a pre-determined range based upon the contractor's ability to meet technical, cost, and/or schedule targets (Incentive Fee).

Cost Reimbursement Contracts. A category of contracts whose use is based upon payment by the government to a contractor of allowable cost as prescribed by the contract. Normally only the "best efforts" of the contractor are required. The basis for payment negotiated may be: (a) cost (no fee); (b) cost sharing; (c) cost-plus-fixed fee; (d) cost plus award fee, and/or (e) cost-plus incentive fee.

Cost-To-Complete (CTC) Forecast. The performing activity's estimate of the cost to complete the remaining tasks. Synonymous with Estimate to Complete.

Cost Variance (CV). A metric for the cost performance derived from earned value data. It is the algebraic difference between the earned value (BCWP) and the actual cost incurred (ACWP). A positive value indicates a favorable condition and a negative value indicates an unfavorable condition.

Critical Path . A sequential path of activities that are tied together network logic that have the longest overall duration from time now until project completion.

Critical Subcontractor. A contractor performing a large or complex portion of a contract that requires a flow-down of earned value management and reporting (e.g., CPR) requirements, and the integration, reviews, acceptance and control of subcontractor system and reporting by the prime contractor. Critical subcontractors are

designated as a result of customer negotiation or by management or by government direction.

Defense Contract Management Agency (DCMA). The Department of Defense (DoD) component that works directly with Defense suppliers to help ensure that DoD, Federal, and allied government supplies and services are delivered on time, at projected cost, and meet all performance requirements. As the DoD Executive Agent for EVMS, DCMA is responsible for ensuring the integrity and application effectiveness of contractor EVMS. The NASA Program/Project contracting officer will normally delegate the responsibility for verifying a supplier's initial and continuing compliance with ANSI/EIA-748 guidelines to the designated DCMA Administrating Contracting Officer (ACO) assigned to a DCMA Contract Management Office (CMO).

Defense Contract Audit Agency (DCAA). The DoD organization tasked with monitoring a contractor's design and implementation of an acceptable accounting system.

Definitized. A contract, contract amendment, or contract supplemental agreement is considered definitized when the final contractual documents are unconditionally executed by both parties to the agreement.

Direct Cost. Any costs that may be identified specifically with a particular cost objective. That is, the portion of labor, material or other cost incurred or expended to meet specifications for an end product, tool or other related service specifically identifiable to the authorized task. It consists of those costs that can be reasonably and consistently related directly and finally without distribution through an overhead unit or account.

Direct Labor. That portion of labor expended in the actual design, tooling, testing and the physical application of labor (including proofing) to material altering its shape, form, nature, or fulfilling a requirement for service.

Discrete Effort. Tasks which have a specific end product or end result, and which through planning: (1) can be specifically defined and assigned a budget for

accomplishment; (2) can be scheduled with clearly definable start and completion dates; and (3) contain criteria against which performance can be measured.

Discrete Milestone. A milestone which has a definite, scheduled occurrence in time signaling the finish of an activity, such as "release drawing," "pipe inspection complete," and/or signaling the start of a new activity. A type of "objective indicator."

Earned Value (EV). The budgeted value for work accomplished. The value of completed work expressed in terms of the budget assigned to that work. It is the sum of budgets for completed work packages and completed portions of open work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort. Also known as Budgeted Cost for Work Performed (BCWP).

Earned Value Management (EVM). A tool for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the execution of the project. EVM provides quantification of technical progress, enabling management to gain insight into project status and project completion costs and schedules. Two essential characteristics of successful EVM are EVM system data integrity and carefully targeted monthly EVM data analyses (i.e., risky WBS elements).

Earned Value Management System (EVMS). The integrated set of policies, processes, systems and practices that meet an organization's implementation of ANSI/EIA-748. An integrated management system and its related subsystems that allow for planning all work scope to completion; assignment of authority and responsibility at the work performance level; integration of the cost, schedule, and technical aspects of the work into a detailed baseline plan; objective measurement of progress (earned value) at the work performance level; accumulation and assignment of actual costs; analysis of variances from plans; summarization and reporting of performance data to higher levels of management for action; forecast of achievement of milestones and completion of events; forecast of final costs; and disciplined baseline maintenance and incorporation of baseline revisions in a timely manner.

Earned Value Management System (EVMS) Guidelines. The set of 32 guidelines established in EIA-748, which define the parameters within which the integrated cost and schedule management system must fit.

Estimate At Completion (EAC). A value (expressed in dollars and/or hours) developed to represent a realistic project ion of the final cost of a task (or group of tasks) when completed. EAC is the sum of direct and indirect costs to date, plus the estimate of costs for all authorized remaining work. EAC=Inception to data ACWP+ETC

Estimate To Complete (ETC). That portion of the EAC that addresses total expected costs for all work remaining.

Fiscal Year. For the United States government, it is the 12 month period: 1 October through 30 September. For industry, it may be any formally selected annual accounting period including a calendar year.

Fixed Price Contracts. A category of contracts based on the establishment of a price to accomplish the required work. Types are: (a) firm fixed price; (b) fixed price with escalation; (c) fixed price redeterminable, and (d) fixed price with incentive provisions.

Front Loading. An action to provide adequate or generous budget in the near-term budget baseline at the expense of the far-term effort. This practice delays acknowledgment of potential overrun conditions, frequently in the expectation of recovery through subsequent changes in the statement of work. Front loading often results from an inadequate or unrealistic budgets and/or unrealistically optimistic planning of far-term effort.

Functional Organization. An organization or group of organizations with a common operational orientation such as Engineering, Manufacturing, (Fabrication, Assembly), Tooling, Quality Control, Material, Finance, Contracts, etc. See Organization Breakdown Structure (OBS).

Functional Manager. A line manager or supervisor of a functional organization.

Funding Profile. A display of project funding requirements normally presented on a cumulative basis by months or quarters.

Gantt Chart. A horizontal bar chart. A graphic representation used as an aid to effective scheduling and control, showing graphically on a time scale when certain events are to take place or where deadlines occur. Status is displayed by either filling the bar or adding a filled-in status bar below it.

General & Administrative Expense (G&A). Expense incurred in the overall Corporate and Division offices, i.e., their cost of staff services such as, finance, legal, contract administration, sales, marketing and independent research and development (IR&D) effort. These expenses are allocated to organizational elements on the basis of total direct and indirect cost.

Giver/Receiver Schedule. The logical relationships and interdependencies in a Critical Path Methodology (CPM) based schedule supported by the matching of deliverables and users relationships for all products produced by the Project. The Project produces a report from the schedule system which demonstrates these relationships for all deliverables produced.

Indirect Budget. The target value established for costs to be incurred by persons and/or organizational elements for tasks or expenses that do not have a direct relationship to the design, testing and/or production of the end product or specified task.

Indirect Cost. Costs that cannot be specifically or immediately identified to a project, but can subsequently be traced or linked to a project and are assigned based on usage or consumption.

Costs that, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs.

Indirect Cost Pools. A grouping of indirect costs identified with two or more cost objectives but not separately identified with any final cost objective. Such separate pools are normally established for indirect costs associated with Engineering, Manufacturing, Procurement, and/or Material, etc.

Interim Budget. Furnished to departments on an interim basis for authorized tasks for which a firm bid or estimate may not yet have been completed and negotiated. It is also

used for task transfers between departments or elements of cost pending formal budget transfer. Interim budget is discontinued after budget values are formalized.

Joint Surveillance. Continual observation, by a team of Government and contractor representatives, of a supplier's earned value management system to monitor its compliance with the EIA-748 Guidelines and its proper use as a management tool.

Level Of Effort (LOE). Effort of a general or supportive nature that does not produce definite end products.

Management Reserve (MR). An amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement Baseline.

Material. Property which may be incorporated into or attached to an end item to be delivered, or which may be consumed or expended in the performance. It includes, but is not limited to, raw and processed material, parts, components, assemblies, fuels and lubricants, and small tools and supplies.

Milestones. Events of particular significance. Finitely defined events that constitute the start or completion of a task or occurrence of an objective criterion for accomplishment. Milestones should be discretely identifiable; the passage of time alone is not sufficient to constitute a milestone. However, milestones should be associated with schedule data to document when the milestone is to occur. (See Objective Indicator.)

Negotiated Contract Cost (NCC). The estimated cost negotiated in a cost-plus-fixed-fee contract or the negotiated contract target cost in either a fixed-price incentive contract or a cost-plus-incentive-fee (or award fee) contract.

Network Schedule. A schedule format in which the activities and milestones are represented along with the interdependencies between activities. It expresses the logic as to how the work scope will be accomplished. Network schedules are the basis for critical path analysis, a method for identification and assessment of schedule priorities and impacts.

Non-Recurring Cost. Expenditures for specific tasks that are expected to occur only once, or very infrequently, on a given project. Examples are such costs as those for preliminary design effort, qualification testing, initial tooling, testing, planning, etc.

Objective Indicator. A finite event or accomplishment that can be used to definitively establish the degree of completion of a specific task.

Organizational Breakdown Structure (OBS). A family-tree breakdown of an organization showing the organizational elements involved in performing the work.

Other Direct Cost (ODC). A group of accounting elements, other than direct labor and material, which can be isolated to specific tasks. ODC includes such items as travel, computer time, aviation fuel, etc.

Overhead. (See Indirect Costs.)

Overrun. Costs incurred in excess of the allocated budget for a task, group of tasks, project, or a contract. For work in process, the overrun is the cost incurred in excess of earned value.

Over Target Baseline. A performance measurement baseline where the total allocated budget is in excess of the contract value (contract budget base) or project baseline. It may involve replanning in-process work, and/or adjusting variances.

Performance Measurement Baseline (PMB). The time-phased budget plan against which performance is measured. It is formed by the budgets assigned to scheduled control account and the applicable indirect budgets. For future effort, not planned to the control account level, the performance measurement baseline also includes budgets assigned to higher level WBS elements and undistributed budgets. It equals the total allocated budget less management reserve.

Planned Value. Same as Budgeted Cost for Work Scheduled.

Planning Package (PP). A logical aggregation of work within a control account, normally the far-term effort, that can be identified and budgeted in early baseline planning, but is not yet defined into work packages.

Post Acceptance Review. A government review performed on a specific element or elements of a performing activity's EVMS system that display(s) a lack of discipline or no longer meet(s) the intent of the EVMS Guidelines.

Price Variance (PV). The portion of a material cost variance due to price change. The difference between the planned unit cost of materials and the actual unit cost of material. PV is derived by subtracting the planned unit price times the quantity used from the actual unit price times the quantity used.

Program (or Project or Product) Manager (PM). The person assigned the prime responsibility for overall management of a program (or project, or product).

Progress Payments. Payments made to a contractor or subcontractor during the life of a fixed price type (firm fixed price and fixed price incentive) contract on the basis of a percentage of total incurred cost.

Quantity Variance (QV). (See Usage Variance).

Recurring Costs. Expenditures against specific tasks that occur on a repetitive basis. Examples are costs of sustaining engineering support, repeated fabrication or assembly of parts or products, tool maintenance, etc.

Replanning. The process by which a program or project updates or modifies its plans. This applies to a change in the original authorized PBB or CBB planning for accomplishing formally authorized requirements, typically involving the redistribution of budget for remaining work. In accordance with the ANSI/EIA-748, traceability is required to previous baselines, and funding requirements need to be considered in any replanning effort. There are two types of replanning:

- Internal Replanning. Replanning actions performed by the supplier for remaining effort within the recognized Project Budget Base or CBB. It is caused by a supplier's need to accommodate cost, schedule, or technical problems that may have made the original plan unrealistic. Internal replanning is restricted to remaining effort and if significant, the customer must be advised of the action.
- Authorized Change (or External) Replanning. A change necessitated by government/ customer direction which may be in the form of either a definitized or

a no cost contract change order for contracts or formal change to the Project Plan for in-house Projects that calls for a change in the original plan. It most often results from a change in the authorized requirement affecting cost, schedule, technical parameter or a combination thereof.

Reprogramming (or Formal Reprogramming). A comprehensive replanning of the remaining PMB that result in an Over-Target Baseline (OTB), an Over-Target Schedule (OTS) or both. This type of replan is for performance measurement purposes only and requires prior coordination and approval of the Customer.

Risk Analysis. The system that provides a continuous analysis of identified risks with respect to their impact on project cost, schedule, and technical performance.

Rolling Wave Planning. The progressive refinement of work definition as time goes on by continuous subdivision of downstream activities into detailed tasks.

Rubber Baselining. Actions by the supplier to advance far-term budgets into the current or early periods to mask current cost problems. The action involves moving budget without a corresponding amount of task, to cover current cost difficulties. It is an indication of likely overrun condition.

Schedule. A plan that defines when specified work must be started, worked on, and finished, to accomplish program objectives on time.

Schedule Performance Index (SPI). A measure of schedule efficiency. It compares the BCWP to the work scheduled (SPI = BCWP / BCWS). An index of 1.0 means the work is being performed right to the schedule. SPI > 1.0 means that the work is ahead of schedule. SPI < 1.0 means that the work is behind schedule.

Schedule Variance (SV). A metric for the schedule performance on a program. The algebraic difference between the earned value (BCWP) and the budget plan (BCWS). (SV=BCWP-BCWS) A positive value is a favorable condition while a negative value is unfavorable. It may be expressed for a specific period or cumulative to date.

Statement Of Work (SOW). The document that defines the work scope requirements on a program or contract.

Subcontract. A contract for services, data, parts, components, assemblies, other hardware, or software that a company commits to perform for or provide to the prime contractor. A subcontract normally involves the design or production of a component by the supplier to the prime contractor's specifications.

Summary Level Planning Package (SLPP). An aggregation of work for far-term efforts, not able to be identified at the control account level, but which can be assigned to higher level WBS elements (and is therefore not "undistributed budget").

Surveillance. The continuous process of reviewing the health of the earned value management system (EVMS) as applied to one or more projects.

Surveillance Plan. An annual plan that identifies the projects to be included in surveillance reviews, as well as the frequency and scope of the individual surveillance visits planned for each project included in the annual plan.

Task. A piece or portion of discrete, apportioned, or level-of-effort work. Also called an activity, something that takes place over a period of time and generally consumes resources.

Thresholds. Boundaries or limits (monetary, time, or other values), which, if breached, result in some type of management review and action.

To-Complete Performance Index (TCPI). The future cost efficiency needed to accomplish the remaining work within a financial goal such as the Budget at Completion (BAC) or the Estimate at Completion (EAC). It compares the budget for remaining work with the remaining cost or the estimated remaining cost to complete the work. TCPIBAC = (BAC – BCWP cum) / (BAC – ACWP cum). Or TCPIEAC = (BAC – BCWP cum) / (EAC – ACWP cum). Compare the CPI to determine if the BAC or the EAC is realistic or not.

Total Allocated Budget (TAB). The sum of all budgets allocated to a project/contract. Total allocated budget consists of the PMB and all MR. The TAB should reconcile directly to the project/contract budget base. If the TAB is greater than the project/contract budget base, the difference is attributable to an over target baseline and must be documented.

Undistributed Budget (UB). Budget associated with specific work scope or authorized changes that have not been assigned to a control account or lower level WBS element.

Unpriced Changes. Authorized changes that are not yet priced.

Usage Variance (UV). The portion of material cost variance due to a change in quantity of material used. The difference between planned quantity of materials and the actual quantity used, expressed in dollars. UV is derived by subtracting from planned quantity times planned unit cost, the actual quantity times planned unit cost. (Same as Quantity Variance.)

Variance Analysis Report (VAR). An internal document, within an earned value management system, for the analysis and reporting of variances which breech the established thresholds. It requires the reason or cause of the variance; the impact on cost or schedule; and the corrective action required, or accomplished, on significant variances. Format 5 of the CPR is a VAR.

Variance At Completion (VAC). The difference between the total budget assigned to a contract, project, WBS element, organizational entity, control account, or work package and the estimate at completion. It represents the amount of expected overrun or underrun. (VAC equals BAC minus EAC, i.e., total allocated budget minus the related estimated final cost).

Variance Threshold. Internal and external tolerances (or thresholds), which are established by management direction, or negotiation with the customer and which, when exceeded, require investigation, analysis, reporting and corrective action.

Work Breakdown Structure Element. A single discrete portion of a WBS. May be an identifiable product, a set of data, or a service.

Work Package (WP). **)**. A detail, short duration task or material item identified by the Project Control Account manager for accomplishing a Control Account task. A work package has the following characteristics:

- Represents unit of work at the level where work is performed.
- Clearly separate from other Work Packages.

- Assignable to a single organizational element.
- Has scheduled start and completion dates, and interim milestones, if required, all of which represent physical accomplishment.
- Has budget expressed in terms of dollars or hours/FTEs.
- Its duration is limited to a relatively short span.
- Is integrated with detailed engineering, shop, or other schedules.
- Has a correct Earned Value Technique assigned to it.

Work Package Budgets. Resources that are formally assigned by the contractor to accomplish a work package, expressed in dollars, hours, standards or other definitive units

APPENDIX G IBR TRAINING

EARNED VALUE MANAGEMENT / AND INTEGRATED BASELINE REVIEWS

1

IBR Training Agenda

- General IBR Process
- Earned Value Management Overview
- IBR Overview

2

INTEGRATED BASELINE REVIEW PROCESS

3

Importance of an IBR

IBR lays a solid foundation for project execution and increases the odds of successful project completion

- Opportunity to compare project manager(s) expectations and to address differences before problems arise
- Understand the project plan and risks - target resources to meet project challenges
- Increased confidence in the project cost, schedule, and performance data - a tool for proactive project management and the capability to make timely and reliable cost and schedule projections



1

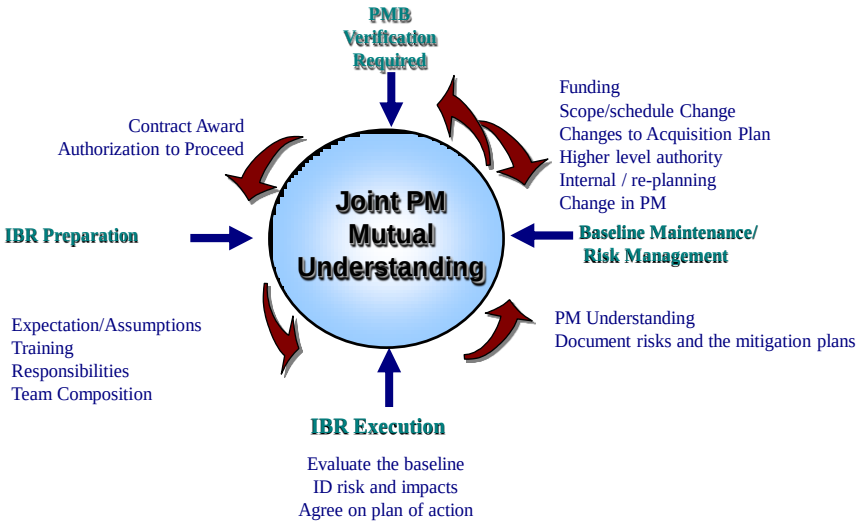
Intent of IBR

- **The IBR should confirm that the Performance Measurement Baseline (PMB)**
 - captures the entire technical scope of work
 - work is scheduled to meet the project objectives
 - risks are identified
 - the proper amount and mix of resources have been assigned to accomplish all requirements
 - management control processes are implemented.

Recognize that the IBR is an event, however the purpose and objectives should be viewed as a continuing process to ensure mutual understanding of the PMB and associated risk.

5

IBR Process



6

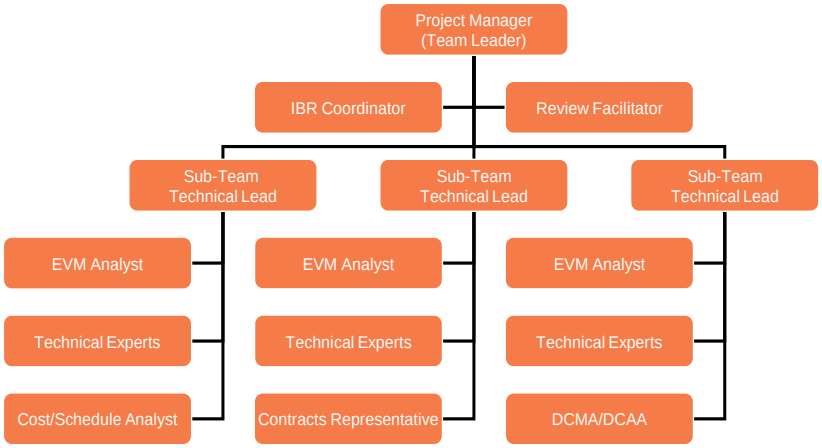
Assessment Process

A PMB that is complete and documented at the appropriate level of detail is a key element for project management to successfully achieve project objectives.

Focus on risks that may impact project planning and execution

7

IBR Team Structure



8

Training/Preparation

- The intent of the training is to provide enough information so the team can understand the cost, schedule, technical, and management processes used on this project.
 - Scope of Work/Statement of Objectives
 - Budget Baseline
 - Schedule Baseline
 - Funding
 - EVM Basics
 - IBR Conduct
 - Project Managers' Expectations
 - Project Management Processes
 - Risk Identification and Documentation
 - Subcontractor(s)

9

IBR Execution

The focus when conducting the IBR is the mutual understanding of the PMB content and the risk. Anything that does not support the purpose should be moved outside the review.

The key event is the control account managers discussions

– **The discussions should focus on the key aspects of the PMB.**

To be effective the discussion team must remain small, focused, and composed of knowledgeable participants

10

Identify Risks

- **Review and incorporate into the project's risk management plan: the technical, cost, and schedule risk as identified in the PMB, and the risk of the management processes to successfully execute the PMB.**
- ***To identify project risks the following items must be assessed***:
 - **Scope**: impact on product meeting performance requirements and funding authorization
 - **Schedule**: Logical flow concerns, Task dependency gaps, Adequate time to accomplish
 - **Resources**: Supports schedule & scope to meet performance requirements
 - **Management control processes**: the degree in which effective cost/schedule/technical planning and control processes exist and are implemented,
 - **Management Reserve (MR)**: should also be compared against risk assumptions. The assessment should determine whether there is sufficient management reserve to address the risk items identified.

11

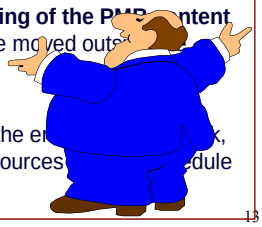
IBR Closeout

- After completion of the IBR discussions there needs to be a closure plan.
 - The Project Manager should agree on a plan of action and who is responsible for the action.
 - Risk items identified need to be classified as to the severity of the risk involved.
 - Those items identified, as Action Items require Project Managers' attention and should be documented in the Risk Management Plan.
 - Items identified as Watch Items represents concerns that may require future attention.

12

Summary

- The **IBR is an event, however the purpose and objectives should be viewed as a continuing process to ensure mutual understanding of the PMB and associated risk**
- The **purpose** of an IBR is to **achieve a mutual understanding of the risks** inherent on the PMB and the management control processes that will operate during execution
- IBR **preparation and planning** are the **key** to a successful review
- A **PMB** that is complete and documented at the appropriate level of detail is a **key element for project management** to successfully achieve project objectives
- The **focus** when conducting the IBR is the **mutual understanding of the PMB content and risk**. Anything that does not support the purpose should be moved outside review
- Evaluate the integrated PMB to determine whether it, captures the entire [illegible], is consistent with authorizing documents, and has adequate resources [illegible]edule requirement and planned project tasks



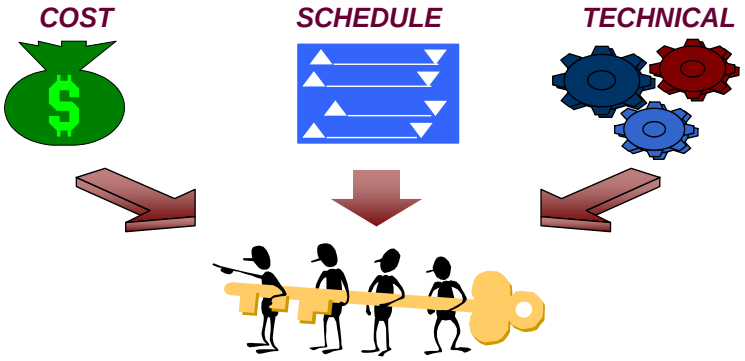
13

BASIC EARNED VALUE MANAGEMENT

14

EVM & Integrated Product Teams
The Key to Success

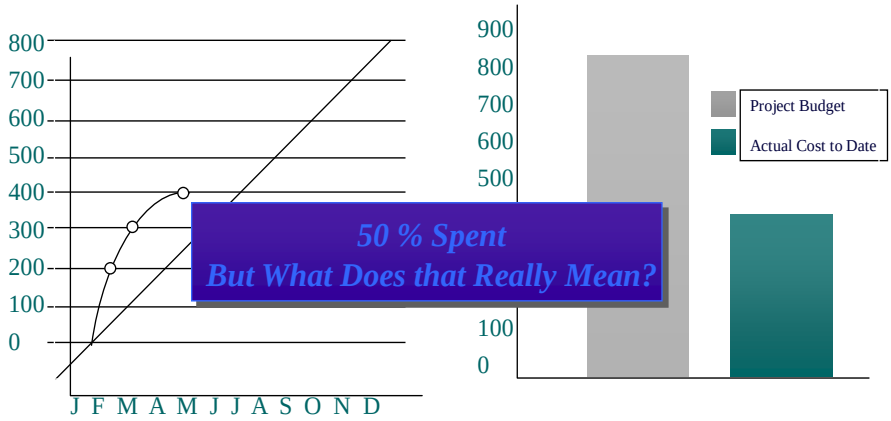
- ☑ Management systems don't manage - people do!
- ☑ EVM is used to identify, communicate and *manage* the resource effect of technical and schedule problems.



15

Traditional Cost Management

Spend Plan vs. Actual **OR** *Budget vs. Actuals*



16

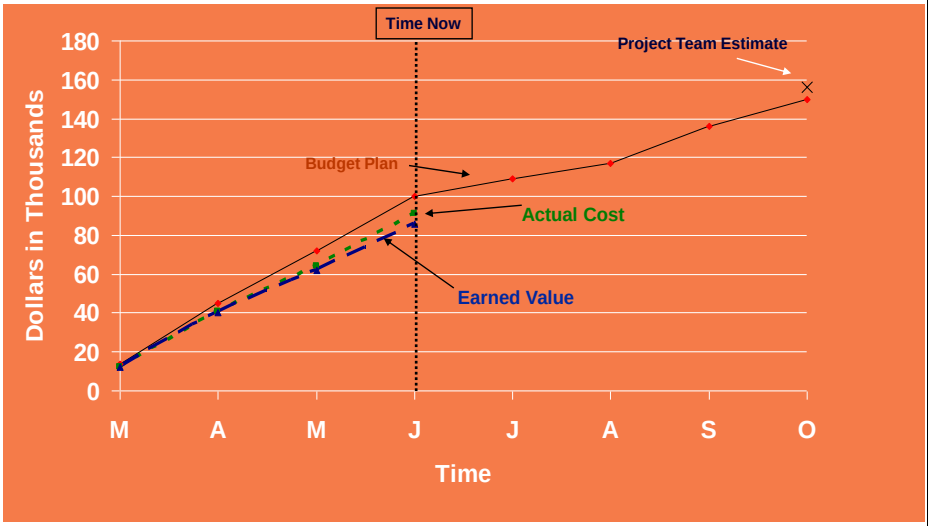
Actual Cost



***Actual Cost** is **not** an indication of work progress, but **only** an indicator of hours/money spent*

17

Contract Performance



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Three Steps to Success...



- identify **what** is to be done in terms of **tasks** and underlying **assumptions**



- specify **when** the work is to begin and end in terms of **order** and **duration**



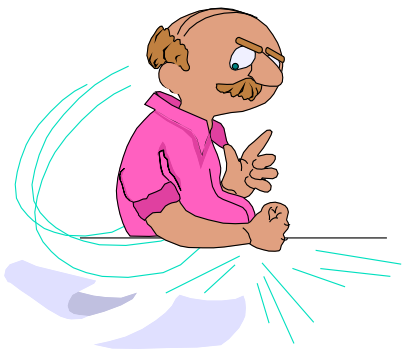
- define **who** will do the work by identifying **resources** (people, equipment, and costs) and **constraints**

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Defining the Work Scope



- identify **what** is to be done in terms of **tasks** and underlying **assumptions**
 - Begins with the SOW/SOO
 - Project Team expands SOW/SOO tasks into work authorization documents
 - Control Account Managers (CAMs) “negotiate” the work scope
 - Everything must be covered



20

Schedule the Work



- specify **when** the work is to begin and end in terms of **order** and **duration**
 - Order = sequence of work
 - Finish to start (start to start, finish to finish)
 - Leads and Lags
 - Added details may reduce risk
 - Duration
 - Total time to complete a task
 - Resource impacts must be considered
- Risk in schedule?

21

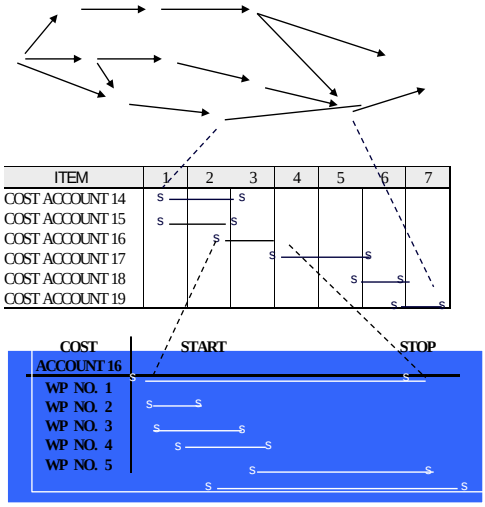
Schedule Integration

PROJECT LEVEL

The master schedule and lower level schedules must be traceable both VERTICAL and HORIZONTAL

These two levels of schedules do not show horizontal relationships.

DETAIL PROJECT LEVEL



PROJECT SCHEDULE

MAJOR EVENT OR FUNCTIONAL ORGANIZATION MILESTONE SCHEDULE

COST ACCOUNT AND WORK PACKAGE SCHEDULES

22

Identify Resources



	Period 1	Period 2	Period 3	Period 4
Engineer	50	22	130	75
Senior Engineer	15	67	50	11
Principal Engineer	20	38	51	28
Systems Engineer	5	64	20	19

Resource requirements shown in hours, direct cost, or total cost.

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The Control (Cost) Account

- **A management control point** consisting of work packages and planning packages, where accountability for performance is measured
- Other characteristics of a control account are:
 - BCWS, ACWP and BCWP are integrated!
 - Variances Are Assessed
 - Estimates Are Revised



24

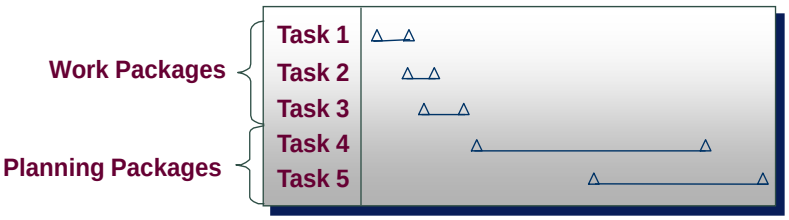
EVM Basics
Control Account Elements

Work Packages

Detailed, short-span tasks, or material items, required to accomplish the CA objectives, typically in the near term.

Planning Packages

Future work that has not been detail planned as work packages. They are always scheduled to occur in the future.



* During the IBR, we look at how earned value was set up, for each task, and how it will be taken.

25

Classifying the Work

- Discrete or Measurable
 - Specific end product or result
 - Preferred category of work because objective
 - EV methods include 0/100, milestone, percent complete, etc.
- Level of Effort (LOE)
 - Has no specific product
 - Measured by the passage of time
- Apportioned effort
 - Dependent on other work, discrete tasks
 - Measured as a factor, e.g., 10% of discrete task

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EVM Basics
Earned Value Terminology

Data Element	*Term*	*Acronym*
Scheduled Work	Budgeted Cost for Work Scheduled	BCWS
Earned Value	Budgeted Cost for Work Performed	BCWP
Actuals	Actual Cost of Work Performed	ACWP
Authorized Work	Budget At Completion	BAC
Forecasted Cost	Estimate At Completion	EAC
Work Variance	Schedule Variance (BCWP-BCWS)	SV
Cost Variance	Cost Variance (BCWP-ACWP)	CV
Completion Variance	Variance At Completion (BAC-EAC)	VAC

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The Language of Earned Value Management

- Control Account - the key management control point at which ACWP, BCWP, and BCWS are managed
- Work Packages - detailed planning of short span jobs or material items representing units of work at levels where work is performed and BCWP is measured
- Planning Packages - a logical aggregation of work which has not been detailed planned into work packages
- Rolling Wave - period of time within which detailed planning must occur
- Measurable or Discreet Effort - contract effort that produces definable end products
- Level of Effort (LOE) - contract effort that does not produce definable end products
- Apportioned Work - effort that be itself is not divisible into work packages

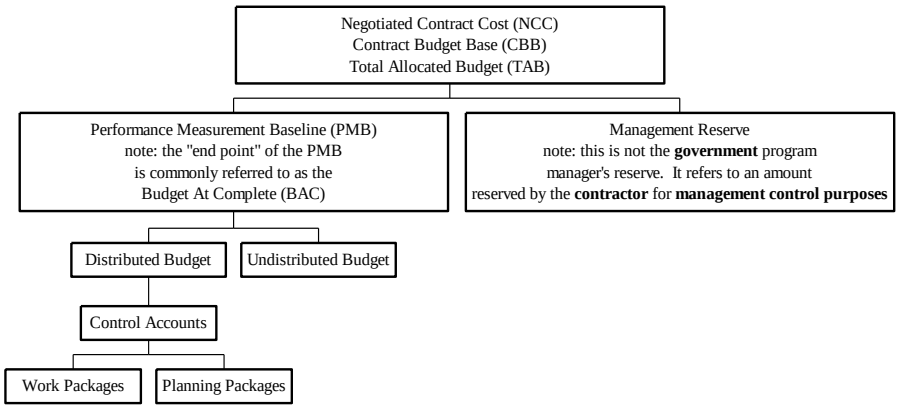
28

The Language of Earned Value Management (cont.)

- Estimate At Complete (EAC) - ACWP, plus an estimate of costs for remaining work
- Budgeted Cost for Work Scheduled (BCWS) - budget for scheduled effort
- Budgeted Cost for Work Performed (BCWP) - the value of the work performed
- Actual Cost of Work Performed (ACWP) -incurred and recorded costs within a given time period
- Cost Variance (CV) - the difference between BCWP and ACWP (CV = BCWP-ACWP)
- Cost Performance Index (CPI) - the average cost efficiency with which work has been performed. (CPI = BCWP/ACWP)
- Schedule Variance (SV) - the difference between BCWP and BCWS (SV = BCWP - BCWS)
- Schedule Performance Index (SPI) - the ratio of the value of work performed to the value of work scheduled (SPI = BCWP/BCWS)

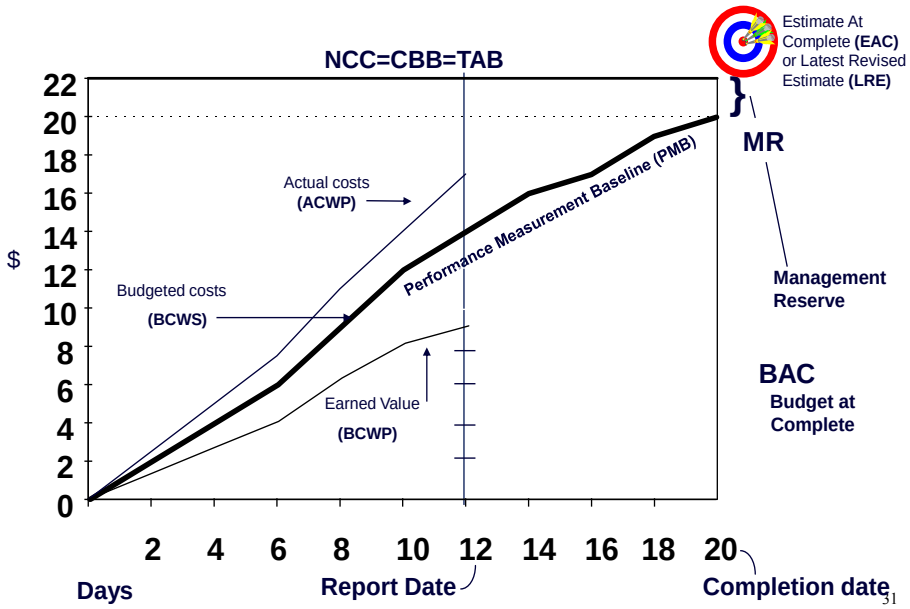
29

Creating the Performance Measurement Baseline (PMB)



30

Completing the Picture



31

INTEGRATED BASELINE REVIEWS

32

Preparing Yourself

- Know your CWBS assignments
 - Be familiar with scope, schedule, budget
- Have an objective. What do you expect to gain from the discussion?
- What questions will you ask to achieve the objective?
- Prepare a tentative list of questions to serve as a framework for the discussion.
- Become familiar with the documentation.
- The multi-functional Team (Cost, Schedule, Technical) is an opportunity to transfer knowledge and experience

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What Documents Will Be Reviewed?

- Work authorization documents
- Control (cost) account plans
- Schedules
- Cost reports
- Project Work Breakdown Structure (PWBS) and Dictionary



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During the Discussion

Keep In Mind...

- Introduce yourself and identify the organization you represent.
- Ask the CAM to walk through his/her notebook.
- Be friendly and non-confrontational. If there appears to be confusion, restate your question. Clarify any misunderstandings.
- Take notes during the discussion. Notes will be used to complete the Discussion Assessment Form and Concern Area Reports (CARs) after the interview.
- If necessary documentation is not readily available, get a commitment of where and when the documents will be available. Fill out Documentation Request Forms when necessary.
- Watch the time, but do not leave until you are satisfied the discussion is complete.
- If disagreements arise, do not argue with the Project Team. Write a CAR to the Team Leader, and let the Team Leader handle any continuing discussion with the Project Team.

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IBR - CAM* Discussions

Technical Assessment:
- What are the high risk areas
- Conditions of measurement
- What are the technical requirements

Schedule Assessment:
- Underdeveloped logic
- Illogical/Forced Sequencing
- Lack of Experience
- Consideration of Technical Risks

Work Authorization:
- Schedules
- Budget Authorization
- Control Account Plans

Budget Assessment:
- Budget Validity/Risk
- Distribution Logic
- Management Reserve
- Undistributed Budget



Work Assessment:
- Which Tasks may be Overstated?
- Which Tasks may be Understated?
- What Tasks have been left out

* Control Account Manager (CAM)

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The Discussion -- Work Scope

- What is your scope of work?
- How did you plan your work into control (cost) accounts?
- How were resources obtained?
- Please describe the resource development process.
- What is your experience on EVMS projects?
- Is all of your work authorized?

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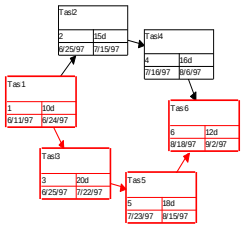
The Discussion -- Schedule

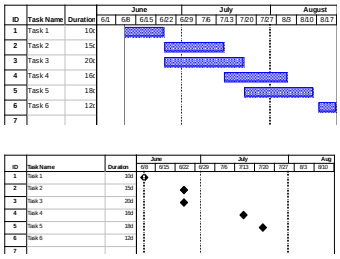
- Can you discuss
 - Identification and management of schedule impacts?
 - Who owes you things and how do you track them
 - How your work relates to project milestones
- Please describe known risks in your plan.
- What assumptions are built into your schedule?

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Common Schedule Presentations

- Commonly used “schedule presentations” have strengths... and weaknesses
 - Gantt Charts
 - Milestone Charts
 - Network Schedules





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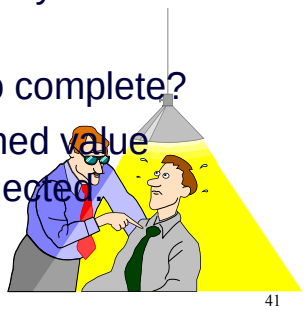
Resourcing the Schedule- A Reality Check

- **Categories of labor** - do they support the task?
- **Labor availability** - are labor resources available during the period of performance?
- **Over/Under Allocation of Resources**



The Discussion -- Budget

- How was the budget for your work developed?
- Is your budget adequate?
- If your budget is inadequate, what are your options?
- Please explain the time-phasing of your budget.
- How do you develop estimates to complete?
- Please explain the particular earned value method(s) and why they were selected.



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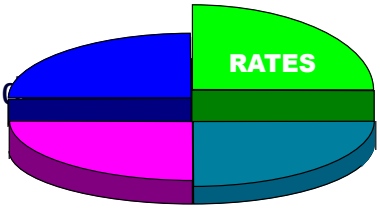
Measuring Performance

- Work Progress quantified through an objective measure
- Performance must be computed using the same labor, overhead, and other rates as scheduled
- Provides a measure of work accomplishment against the plan

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Identify Labor/Overhead Rate Impacts

- Refer to System Description and Accounting Disclosure Statement
- Discuss with DCMA/DCCA recent labor/overhead Rate Trends
- Cost Accounting Standards Compliance issues?
- What are the pools?
- How are indirect monitored?
 - Actuals
 - EAC



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After the Discussion

- Complete the Discussion Assessment Form after each interview.
- Complete Concern Area Report(s), Documentation Request Forms, and General Assessment Form(s) if applicable.
- Submit all forms to the Sub-team leader.
- Be sure to follow up. Do not leave any loose ends hanging.

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Sample Findings

- Technical
 - Scope unaccountable
 - Non-integration of cost and technical performance
 - Subcontractor requirements flow down
 - Lack of work around plans for high risk areas
 - Project Team plans not supporting critical milestones
 - Tooling not being produced quickly enough
 - Software concerns (type of language, productivity factors, and amount of software being written)
 - Specification issues

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Sample Findings (cont.)

- Project Management
 - Schedules not linking
 - Delayed subcontract awards
 - Communication problems
 - Inadequate time scheduled
- Cost
 - Inadequate budgets
 - Time phasing of budgets
 - Unreasonable productivity factors
 - Lack of rework budgets
 - Manager knowledge
 - Unreported future cost impacts
 - Performance measurement issues
 - Management reserve

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Lessons Learned -Before Review

- Subteams should be no larger than 5-6 members
- Knowledge of critical path essential in identifying risk areas
- A large portion of the work is done prior to going on-site
- A well trained team is essential
- Selection of sub-team leader is very important
- Risk areas should be identified early to allow

47

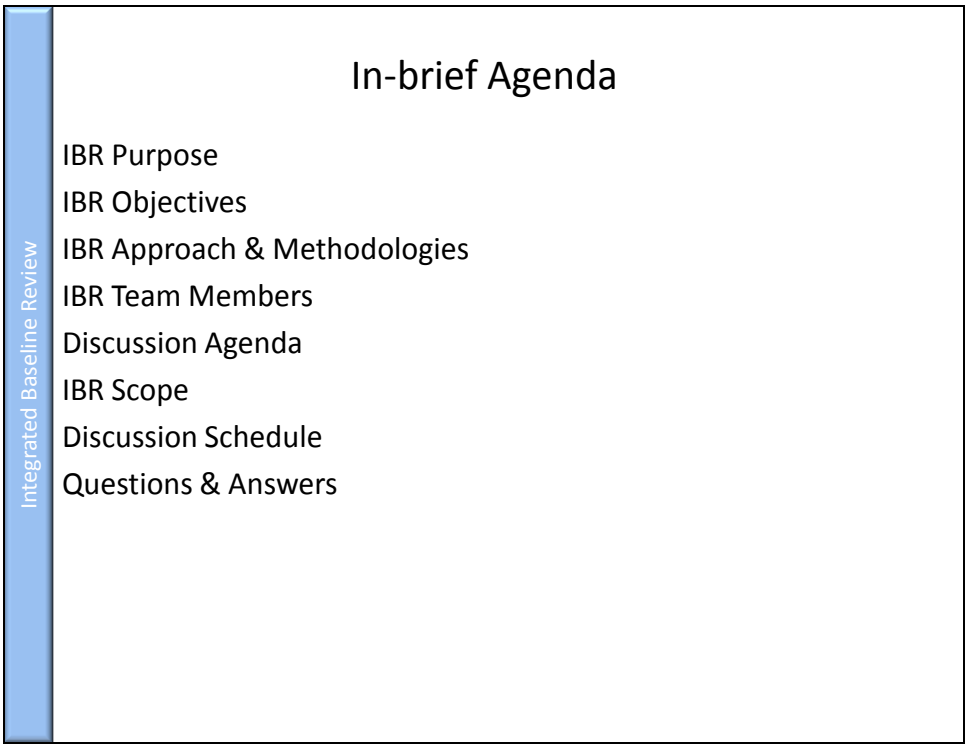
Lessons Learned - During Review

- Coordinate the IBR with other project reviews, when practicable
- Stay focused on the current contract
- Document manager discussions immediately after interviews/discussions
- Do not turn the review into a design review (review is to identify resource/planning problems not solve them)
- Conduct an on-site IBR Team meeting
- Conduct a maximum of 4 discussions per day

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APPENDIX H IBR IN-BRIEF TEMPLATE





Integrated Baseline Review

Purpose of the Review

We ARE conducting the IBR to evaluate the adequacy of the PMB and identifying concerns.

We ARE NOT looking for problems to solve.

We jointly need to be able to answer this basic question...

Can we execute the technical work scope of this contract given the available schedule, budget and other relevant resources?

In other words, do we have a plan and is it feasible?

Integrated Baseline Review

The Objectives of This IBR

Validate and understand the PMB

- Is the entire technical scope of work represented?
- Can the SOW be accomplished?
- work is scheduled to meet the program objectives?
- Are the proper amount and mix of resources have been assigned to accomplish all requirements?

Identify risks to the PMB

- Technical
- Cost
- Schedule
- Resources
- Management processes

Perform corrective actions now

Integrated Baseline Review

IBR Approach and Methods

Control Account Managers discussions

Technical or IPT Managers summary discussions

IBR Team discussions & evaluations

System and Baseline Documentation Reviews

Data traces (sampling only)

Process reviews –

- Scheduling and Risk/EAC
- Change Control
- etc.

It is important to recognize that the IBR is an event, however the purpose and objectives should be viewed as a continuing process to ensure mutual understanding of the PMB and associated risk.

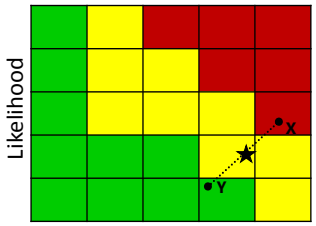
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Integrated Baseline Review

Method for Risk Analysis

What is the likelihood the risk will happen?		
Level	Planned Approach and Processes	
1	Not Likely	Will effectively avoid or mitigate this risk based on standard practices
2	Low Likelihood	Have usually mitigated this type of risk with minimal oversight in similar cases
3	Likely	May mitigate this risk, but work arounds will be required
4	Highly Likely	Cannot mitigate this risk, but a different approach might
5	Near Certainty	Cannot mitigate this type of risk, no known processes or workarounds are available

Likelihood



Given the risk is realized, what would be the magnitude of the impact?			
Level	Technical	Schedule	Cost
1	Minimal or no impact	Minimal or no impact	Minimal or no impact
2	Minimal performance shortfall, same approach retained	Additional activities required, able to meet key dates	Budget increase or unit production cost increase <1%
3	Moderate performance shortfall, but work arounds available	Minor schedule slip, will miss key dates	Budget increase or unit production cost increase <5%
4	Unacceptable, but workarounds available	Program critical path affected	Budget increase or unit production cost increase <10%
5	Unacceptable, no alternatives exist	Cannot achieve key program milestone	Budget increase or unit production cost increase >10%

Consequence

X Pre-Mitigation Risk

Y Risk w/mitigation

★ Current Status

Integrated Baseline Review

Risk Type Definition

Technical: ability of the project's technical plan to achieve the objectives of the scope of work

Schedule: adequacy of the time allocated for performing the defined tasks to successfully achieve the project schedule objectives

Cost: ability of the PMB to successfully execute the project and attain cost objectives, recognizing the relationship between budget, resources, funding, schedule, and scope of work

Resource: availability of personnel, facilities, and equipment, when required

Management Processes: degree to which the management processes provide effective and integrated technical/schedule/cost planning and baseline change control

Integrated Baseline Review

IBR Team Members – <Project Name>

Role	Team Member
Project Manager	
IBR Team Leader (Deputy PM)	
IBR Coordinator	
IBR Facilitator	
EVM/Schedule Management	
Cost/Budget Analyst	
Sub-team Lead <Technical Area>	
Sub-team Lead <Technical Area>	
Sub-team Lead <Technical Area>	
Sub-team Lead <Technical Area>	
Sub-team Lead <Technical Area>	
COTR	

8

Integrated Baseline Review

Agenda

<Tuesday, Month Day, Year >

8:00-9:00	IBR In-briefing, Administrative Details
9:00-10:15	New Documentation Review
10:30-12:00	Discussion Sessions 1
12:30-1:30	Lunch
1:30-300	Discussion Sessions 2
3:00-5:00	Government Team Review

<Wednesday, Month Day, Year >

8:00-9:30	Discussion Sessions 3
10:00-11:30	Discussions Sessions 4
12:00-1:00	Lunch
1:00-2:30	Discussion Sessions 5
2:45-5:00	Government Team Review

<Thursday, Month Day, Year >

8:00-12:00	Government Team Review - Exit Outbrief Preparation
12:00-1:00	Lunch
1:00-1:30	Supplier Manager Debrief
1:30-2:30	IBR Exit Outbrief

Integrated Baseline Review

Scope of IBR

<#of> Discussions and Baseline documentation from Sampling from <#of> Control Accounts:

- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>
- <CAM - Control Account # - Control Account Title>

Integrated Baseline Review

Discussion Schedule

		CAM	Sub-Team Lead	Location
Session 1	Tuesday - 10:30a			
Session 2	<Date & Time>			
Session 3	<Date & Time>			
Session 4	<Date & Time>			
Session 5	<Date & Time>			

Integrated Baseline Review

Discussion Schedule

		CAM	Sub-Team Lead	Location
Session 1	Tuesday - 10:30a			
Session 2	<Date & Time>			
Session 3	<Date & Time>			
Session 4	<Date & Time>			
Session 5	<Date & Time>			

APPENDIX I DOCUMENTATION AND DATA TRACE EVALUATION TEMPLATE

Documentation & Data Trace Evaluation

Date:

Documentation Inventory:

Organization	Yes	No
Does the WBS and related documentation detail the Control Account Work scope?		
Do the Org charts correctly reflect the CAM Organization?		
Control Account Plans		
Is the CAM and relevant WBS/OBS elements adequately referenced?		
Are there any discrepancies between the WBS/OBS and CA/CAP references?		
Does the CAM Name match that shown on the OBS Chart?		
Do the hour and dollar values at the Control Account Level on the RAM/CA		
Statement of Work and Budget Allocation documents match those in the CAP?		
Do the breakdowns for ODC, materials and sub contractor costs etc match those approved at the summary level in the CAP?		
Do all the Open CAs/WPs have Cost Collection Numbers?		
Do any of the PPs have CCNs?		
Do any PPs have an 'Open' Status?		
Do all the WP and PP's have SoWs?		
Do all the WP and PPs have Budgets?		
Are the WBS roll up's accurate?		
Are there duplicate WBS numbers?		
Are WPs/PPs defined at an appropriate level in each project area? (Check for duplicate packages (titles / sows))?		
Do the start and Finish dates on the schedule match those in the CAP?		
Do the schedule/project titles/activity names etc, correspond to the WBS?		
Was the planning process appropriate and in line with planning guidelines (project instructions)?		
RAM	**Yes**	**No**
Does the RAM detail the same WBS as the WBS and OBS charts?		
Do the Dollars, Items and Hours match the CAP front sheet?		
Schedule		
Do the Control Account Schedules tie to the IMS?		
Are all tasks within the CA and Contract Period of Performance?		

Additional Comments:

The Documentation and Data Review has been carried out by:

Name:_____Role:_____

Name:_____Role:_____

Name:_____Role:_____

Name:_____Role:_____

Name:_____Role:_____

APPENDIX J IBR LOGS

Action Item Log

CAR #	CAM / Manager	WBS/CA	Brief Description	Action Description	Responsible Team Member	Target Close

CAM Discussion Log

CAM / Manager	Responsible Area	Discussion Eval #	Risk Eval #	Document Request #'s	CAR #'s	Sub-team Lead

APPENDIX K OUTBRIEF SAMPLES

Integrated Baseline Review
Sample Out-Brief

Project Name

1

IBR Objectives

- Validate and understand the PMB
 - Can the SOW be accomplished?
 - Are adequate resources, schedules and budgets assigned?
- Identify risks
 - Technical
 - Cost
 - Schedule
 - Resources
 - Management processes
- Develop mitigation plans
- Give Project Managers early options

2

Project Risk Summary

IPT	Technical	Schedule	Cost	Resources	Mgmt Processes
Aeronautical & Spacecraft Systems	M	M	L	M	M
Systems I&T	L	L	L	L	M
Payloads	L	L	M	L	M
Mission Ops	M	M	M	M	M
Launch Vehicle/Services	M	L	L	M	M

Low Risk: Little potential to disrupt schedule, increase costs, or degrade performance…no significant issues, the plan is executable. Management processes are adequate, understood and effectively used. Normal government monitoring may overcome difficulties.

Medium Risk: Can potentially disrupt schedules, increase costs, degrade performance…some significant issues but the plan remains executable. Management processes are generally adequate, understood and effectively used. Special contractor emphasis and close government monitoring can overcome difficulties.

High Risk: Likely to significantly disrupt schedules, increase costs, degrade performance…significant issues impacting plan execution. Management processes are not adequate, understood or effectively used. Risk is unacceptable even with emphasis and close government monitoring.

3

Aeronautical & Spacecraft Systems

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** Historical instability issues specific to the SW infrastructure may be exacerbated in Build 2.4 due to functional complexity. (Reference Risk 02-026)
- **Schedule:** Risk mitigation steps established to reduce Build 2.4 schedule risk have not been fully realized due to late delivery and inability to take early looks at weapons functions. (Reference Risk 02-026)
- **Cost:** Cost performance is within budget and adequate budget is available to manage contingencies.
- **Resources:** Lab assets are strained.
- **Management Processes:** Baseline planning and earned value method used are not consistent with expected workload/complexity. The CPR is not providing enough insight into developing cost/schedule problems. This impacts management's ability to effectively use data. Have seen improvements in other processes such as estimating and metrics.

4

Systems Integration & Test

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** No significant concerns noted.
- **Schedule:** No significant concerns noted.
- **Cost:** $1.8M of additional personnel may be off set by reduction of test points.
- **Resources:** All resources to execute the test program have been identified and planned.
- **Management Processes:** Management processes with the exception of change control are robust and provide early indications of problems. Approximately $1.8M of MR was issued to work already in progress. Management team seems to have a good grasp of requirements.

5

Payloads

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** No new unforeseen performance risks identified. Existing watch items of note: 02-023, 00-201A.
- **Schedule:** No new schedule drivers identified. Moderate risk reflects current state of risks already in the database.
- **Cost:** No new cost drivers identified. Moderate risk reflects current state of risks already in the database.
- **Resources:** No new issues identified. Potential still exists for test asset shortfalls.
- **Management Processes:** EVM credit methodology is not sufficiently objective.

6

Mission Operations

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** No significant concerns noted
- **Schedule:** No significant concerns noted
- **Cost:** There are potential additional costs to program if invoices are larger than current budget
- **Resources:** No significant concerns noted
- **Management Processes:** Noted problems with material time phasing and EVM methodology. Invoice problems with subcontractor need to be resolved.

7

Launch Vehicle/Services

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** Moderate risk (16) reflects current state of risks already in the database.
- **Schedule:** No significant concerns noted.
- **Cost:** Adequately budgeted.
- **Resources:** Overtime required to meet accelerated schedule.
- **Management Processes:** No objective or documented quantifiable backup data for EVM methodology. Horizontal integration needs to occur at the work package level.

8

Safety & Mission Assurance

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** There is no documented traceability from SOW to product and task descriptions.
- **Schedule:** Government team planning to review Basis of Estimate to ensure realistic planned durations.
- **Cost:** No concerns noted.
- **Resources:** Current resources are not accomplishing tasks in a timely manner.
- **Management Processes:** EVM methodology is a good model for objective determination and supporting documentation.

9

Total Program

Technical	Schedule	Cost	Resources	Mgmt Process

- **Technical:** There is a good understanding of technical risks and mitigation plans are in place.
- **Management Processes:** The review noted several systemic issues related to EV Management:
 - EVM methodology
 - Reprogramming adjustments
 - CAM responsibility – LRE process, material budget
 - Variance Analysis process

10

New Risks

- Aeronautical & Spacecraft Systems
 - Insufficient time to correct late-breaking priority fixes during test.
 - Current system architecture limits future growth capability as well as existing R&M.
 - Need to provide requirements definitions to subcontractor.
 - There is no budget identified for S/W support during test to include correction of showstoppers.
 - The Lab schedule does not exist in enough detail to ensure maximum use of resources.
- **Systems Integration & Test**
 - Testing procedures at lower levels have not yet been defined.

11

New Risks

- Payload
 - Current weight estimates above allowable weight.
 - Payload may require special support equipment for placement on the vehicle.
- Mission Operations
 - Additional Ground Support Equipment may be required.
 - Unanticipated modifications to existing facilities to support processing.

12

Documents Needed

- Basis of estimate for Supportability
- Time Phased BCWS in $'s by element of cost
- Risk Management Plan
- Control Account Plans

13

General Observations

- Total Concern Area Reports (CARs) generated: 34
- New Risks Identified: 10
- Management Process Systemic Issues
 - Noted improvements but EVM issues still need to be resolved
 - Schedules not resource-loaded
- Commitment from both Teams:
 - Strong Government/Contractor team relationships
 - Concerted effort to understand PMB
 - Tools, processes in place to help managers
 - PMM,
 - Cost/Schedule Comparison; new system on the way
 - Schedule metrics

14

Outstanding Actions

- NASA IBR Team :
 - Assess risks; update existing risks and/or add new risks to Risk Management Plan (Due 28 OCT 05)
 - Formal IBR Letter to contractor/in-house organization with copies of Concern Area Reports (Due 31 OCT 05)
- Contractor/In-House Organization:
 - Provide requested documentation (18 OCT 05)
 - Written response to Concern Area Reports (30 NOV 05)
- IBR Team Leader & Review Facilitator:
 - Evaluate responses to CARs and conduct follow-ups if required. (15 DEC 05)

15

Integrated Baseline Review Sample Out-Brief

<Project Name>
Integrated Baseline Review
<IBR Date>

16

IBR Goals

- Achieve a mutual understanding of the baseline plan and its relationship to the underlying Earned Value Management System (EVMS)
- Assess the adequacy of the performance measurement baseline (scope, schedule, budget, resources, and management processes)

17

SCOPE of IBR

- **Evaluate the current baseline and the associated risks**

18

AREAS ASSESSED

- **Program Management**
- **Aeronautical & Spacecraft Systems**
- **Safety & Mission Assurance**
- **Payloads**
- **System Integration & Test**
- **Launch Vehicle/Services**
- **Science/Technology**
- **Mission Operations**

19

Program Management

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Low	
Resources	Excellent	
Management Processes	Excellent	

- Concerns:
 - None

20

Aeronautical & Spacecraft Systems

Risk	Evaluation	Remarks
Technical	Moderate	
Schedule	Moderate	
Cost	Moderate	
Resources	Excellent	
Management Processes	High	

- **Concerns:**
 - Software growth due to unexpected software problems
 - Baseline planning and earned value method used are not consistent with expected workload/complexity.
 - Cost/Schedule growth due to increase in software effort
- **Action:**
 - Establish more rigorous management processes for baseline maintenance
 - Establish EV methods more appropriate to work accomplishment
 - Update EAC to reflect SW growth.

21

Safety & Mission Assurance

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Low	
Resources	Moderate	
Management Processes	Excellent	

- **Concerns:**
 - Current resources are not accomplishing tasks in a timely manner.
- **Recommendation:**
 - Assign proper staffing mix to S&MA tasks

22

Payloads

Risk	Evaluation	Remarks
Technical	Moderate	
Schedule	Low	
Cost	Low	
Resources	Excellent	
Management Processes	Excellent	

- Concerns:
 - Current weight estimates above allowable weight.
 - Payload may require special support equipment for placement on the vehicle.
- Recommendations:
 - Research methods for weight reduction
 - Utilize COTS for support equipment.

23

Systems Integration & Test

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Moderate	
Resources	Moderate	
Management Processes	Excellent	

- Concerns:
 - Budget for system level testing not identified.
 - Potential loss of staff and staff conflicts with testing
- Action:
 - Identify budget for system Level testing.
 - Increase resources to meet test plan.

24

Launch Vehicle/Services

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Low	
Resources	Excellent	
Management Processes	Moderate	

- Concerns:
 - No objective or documented quantifiable backup data for EVM methodology. None
- Actions:
 - Identify and assign objective EV methods.

25

Science/Technology

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Low	
Resources	Excellent	
Management Processes	Excellent	

- Concerns:
 - None

26

Mission Operations

Risk	Evaluation	Remarks
Technical	Low	
Schedule	Low	
Cost	Moderate	
Resources	Moderate	
Management Processes	Excellent	

- Concerns:
 - Additional Ground Support Equipment may be required.
 - Unanticipated modifications to existing facilities to support processing.
- Recommendations:
 - Ensure good configuration management planning for tracking design changes that may impact operations.
 - Identify additional costs in the EAC.

27

Program Level Risks

- Risks
 - Shared Resources with multiple programs
 - Software Slip
 - Software Maturity
 - Software Maintenance
 - Compressed Schedule

28

Actions/Recommendation

- Govt EVM analyst to monitor MR usage for remainder of contract
- Govt to send Contractor a request for an impact proposal
 - Impact of program schedule slips to software baseline
 - Schedule Review after contract modification to address the change to the Baseline

29

IBR Assessment

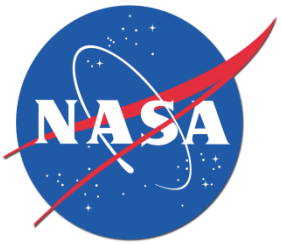
- **Strengths**
 - CAM's knowledge
 - Cost, Schedule and Performance
 - EVMS
 - IBR preparation/baseline documentation
- **Weaknesses**
 - No significant weaknesses identified

OVERALL ASSESSMENT

GREEN

30

APPENDIX L IBR LETTER OF FINDINGS TEMPLATE



<Project Name>

Integrated Baseline Review - Letter of Findings

Supplier: < Supplier Name>
Contract Number: <Contract #XXXXXXX>

Date: <Month Day, Year>

To: <Supplier Contract Officer Name, Organization>

SUBJECT: Notification of Integrated Baseline Review (IBR) Findings for <Subproject Name or Contract #>.

The <Project Name> IBR Team conducted an Integrated Baseline Review (IBR) of contract <Contract #> at your facility in <Supplier Address> during <Date of IBR>. The team identified areas of concern, requests for documents and provided risk assessment as contained in attachment (1), Concern Area Reports.

Status on action Items and documentation requested should be directed to <IBR Coordinator Name> at <Phone Number & Email>. Action Items and Documentation requests should be completed by <Date>, unless other arrangements are made with <Review Team Lead Name> at <Phone Number & Email>.

Any contractual questions should be directed to <Project COTR Name> at <Phone Number & Email> and earned value management question should be directed to <Review Team Lead Name> at <Phone Number & Email>.

<PM NAME>
Project Manager
<Project Name> Project

Attachment 1: Concern Area Reports
Cc:
Government COTR
Review Team Lead
Review Team Members

APPENDIX M IBR REPORT

Sample Review Report

1. Introduction. Identify the contract purpose, type, duration, amounts (total, ceiling price, target costs, etc.), the project being supported, and the cognizant government component. Also, identify the specific contract requirement for an earned value management system.

2. Purpose. Identify the purpose of the review.

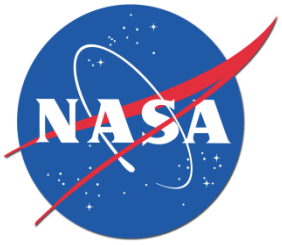
3. Scope. Identify the specific contractual entity that is the subject of this review; for example, division, company, plant, and the functional organizations, such as engineering, manufacturing, quality assurance, or individual process teams. Discuss whether the review is related to development, production, or construction contract. Identify CWBS areas covered, the methodology used in conducting the review, indicating such items as range of CAM discussions, depth of review, documents examined, and traces conducted. Team members and their associated responsibilities should be identified in this section.

4. Findings. Identify areas of concern including a complete discussion of condition, cause and effect. If the concerns are not resolved by the time the report is written, a schedule for their resolution should be attached.

During the course of the review, if concerns surfaced relative to the EVM System and its processes, these should be communicated to the appropriate personnel for proper resolution.

5. Conclusions and Recommendations. This portion of the report contains any conclusions and recommendations based on review findings. This should include any action items and, if applicable, specific areas needing further review.

APPENDIX N IBR CLOSURE NOTIFICATION LETTER TEMPLATE



<Project Name>

Integrated Baseline Review – Closure Notification

Supplier: < Supplier Name>
Contract Number: <Contract #XXXXXXX>

Date: <Month Day, Year>

To: <Supplier Contract Officer Name, Organization>

SUBJECT: Notification of Integrated Baseline Review (IBR) closure.

The <Project Name> IBR Team conducted an Integrated Baseline Review (IBR) of contract <Subproject Name or Contract #> at your facility in <Address> during <IBR Dates>.
All actions resulting from Concern Area Reports from this review are closed.
Any contractual questions should be directed to <COTR Name> at <Phone Number & Email> and earned value management question should be directed to <IBR Team Lead Name> at <IBR Team Lead Name, Phone, Email>.

<PM Name>
Project Manager
<Project Name> Project

APPENDIX O GLOSSARY

GLOSSARY OF TERMS

Actual Cost of Work Performed (ACWP) (or Actual Cost). The costs actually incurred and recorded in accomplishing the work performed within a given time period. Actual costs include the direct cost plus the related indirect cost such as overhead, G&A, etc. allocated to the activity.

Administrative Contracting Officer (ACO). The individual within the Defense Contract Management Agency (DCMA) Contract Management Office (CMO) responsible for ensuring that the functions described in DFARS 242.302 are completed by the contractor in accordance with the terms and conditions of the contract.

Applied Direct Costs. The actual direct costs recognized in the time period associated with the consumption of labor, material, and other direct resources, without regard to the date of commitment or the date of payment. These amounts are to be charged to work in-process when any of the following takes place:

- When labor, material and other direct resources are actually consumed.
- When material resources are withdrawn from inventory for use.
- When material resources are received that are uniquely identified to the contract and scheduled for use within sixty days.
- When major components or assemblies that are specifically and uniquely identified to a single, serially numbered end-item are received on a line-flow basis.

Apportioned Effort. Effort which by itself is not readily divisible into short-span work packages but which is related in direct proportion to some other measured effort.

Authorized Unpriced Work. Any effort for which contractually definitized costs have not agreed upon, but for which written authorization has been received.

Authorized Work. Effort which has been definitized and is on contract, plus that effort for which definitized contract costs have not been agreed to but for which written authorization has been received.

Baseline. See “Performance Measurement Baseline.”

Bill Of Material (BOM). A listing of material items required to complete the production of a single unit. When actual or expected prices are applied, it becomes the Priced Bill of Material (PBOM).

Bottoms–Up Cost Estimate. An estimate derived by summing detailed cost estimates of the individual work packages and adding estimated level of effort plus appropriate indirect cost

estimates. Frequently accomplished as an independent analysis by Industrial Engineering, Price Analysis and Cost Accounting.

Budget. A plan of operations for a fiscal period in terms of estimated costs or hours.

Budget At Completion (BAC*)*. The sum of all budgets (BCWS) allocated to the project or a given Control Account. It is synonymous with the term Performance Measurement Baseline (PMB).

Budgeted Cost For Work Performed (BCWP) (or Earned Value). The sum of the budgets for completed work packages and partially completed work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort work packages.

Budgeted Cost For Work Scheduled (BCWS) (or Planned Value) The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period. This is the value of planned work.

Budgeting. The process of translating approved resource requirements into a time-phased plan for accomplishing work.

Burden. See "Indirect Expense" and "Overhead."

Burdened Cost. The sum of direct cost plus all applicable indirect cost.

Contract Budget Base (CBB). The sum of the negotiated contract cost plus the estimated cost of authorized but unpriced work. IT includes the PMB and MR. Customer approval is generally required to change it.

Contract Change Order. A formal revision or change to a contract that may impact the scope of work, schedule, cost, price, and/or other contractual requirements.

Contract Data Requirements List (CDRL). A compilation of all data requirements (DD Form 1423) that the contractor is obligated to submit to the government.

Contract Line Item Number (CLIN). The number used within a contract to identify a specific deliverable item.

Contract Master Schedule (CMS). The highest summary level schedule for a contract, depicting overall contract phasing and all major interfaces, contractual milestones, and contract elements (sometimes called Integrated Master Schedule).

Contract Performance Report (CPR). A contractually required recurring report designed to provide information on contract cost performance status, problems, and corrective actions (DI-MGMT-81466).

Contract Schedules. Schedules that are initiated at the direction of the customer or management to reflect program plans for development or production of deliverable items. The

highest level schedule is the Contract Master Schedule supported by Intermediate Level Schedules and by lowest level detail schedules.

Contract Work Breakdown Structure (CWBS). A work breakdown structure (WBS) of the products or services to be furnished under contract. It is comprised of selected Project WBS elements specified in the contractual document and the contractor's lower level extensions of those elements.

Control Account (CA). A management control point at which budgets (resource plans) and actual costs are accumulated and compared to the earned value for management control purposes. A control account is a natural measurement point for planning and control since it represents the work assigned to one responsible organizational element (or integrated product team) for a single WBS element.

Control Account Manager (CAM). A manager responsible for task performance of a Control Account and for planning and managing the resources authorized to accomplish such task.

Control Account Plan (CAP). A format upon which a control account plan is displayed. A CAP typically displays the control account scope and budget in time-phased work packages and planning packages, cost element visibility, earned value techniques for each work package, responsible performing organizations and at least one charge number.

Cost-At-Completion (CAC). Actual direct costs, plus indirect costs allocable to the contract, plus the estimate of costs (direct and indirect) for authorized work remaining. The CAC is sometimes referred to as Estimate-at-Completion (EAC) or Latest Revised Estimate (LRE).

Cost Element. Typical elements of cost are: direct labor, direct material, other direct costs, and indirect cost (overhead).

Cost Incurred. A cost identified through the use of the accrual method of accounting and reporting or otherwise actually paid. Cost of direct labor, direct materials, and direct services identified to and necessary for the performance of a contract, and all properly allocated and allowable indirect costs as shown by the contractor's books of record. (See Actual Direct Cost and Applied Direct Cost.)

Cost Performance Index (CPI). A measure of cost efficiency. It compares BCWP to the actual cost to perform that work (CPI=BCWP/ACWP). An index of 1.0 means that we are spending exactly what we planned to spend to accomplish the work performed. CPI > 1.0 means we are under running costs. CPI < 1.0 means that we are over running costs.

Cost Plus Award Fee/Fixed Fee/Incentive Fee. Cost reimbursement contract types where the fee is based upon: (a) the accomplishment of pre-negotiated goals (Award Fee); (b) a negotiated fixed fee amount (Fixed Fee); or (c) a risk sharing ratio within a pre-determined

range based upon the contractor's ability to meet technical, cost, and/or schedule targets (Incentive Fee).

Cost Reimbursement Contracts. A category of contracts whose use is based upon payment by the government to a contractor of allowable cost as prescribed by the contract. Normally only the "best efforts" of the contractor are required. The basis for payment negotiated may be: (a) cost (no fee); (b) cost sharing; (c) cost-plus-fixed fee; (d) cost plus award fee, and/or (e) cost-plus incentive fee.

Cost-To-Complete (CTC) Forecast. A contractor's estimate of the cost to complete the remaining tasks on a contract. Synonymous with Estimate to Complete.

Cost Variance (CV). A metric for the cost performance derived from earned value data. It is the algebraic difference between the earned value (BCWP) and the actual cost incurred (ACWP). A positive value indicates a favorable condition and a negative value indicates an unfavorable condition.

Critical Path. A sequential path of activities that are tied together network logic that have the longest overall duration from time now until project completion.

Critical Subcontractor. A contractor performing a large or complex portion of a contract that requires a flow-down of earned value management and reporting (e.g., CPR) requirements, and the integration, reviews, acceptance and control of subcontractor system and reporting by the prime contractor. Critical subcontractors are designated as a result of customer negotiation or by management or by government direction.

Defense Contract Management Agency (DCMA). The Department of Defense (DoD) component that works directly with Defense suppliers to help ensure that DoD, Federal, and allied government supplies and services are delivered on time, at projected cost, and meet all performance requirements. As the DoD Executive Agent for EVMS, DCMA is responsible for ensuring the integrity and application effectiveness of contractor EVMS. The NASA Program/Project contracting officer will normally delegate the responsibility for verifying a supplier's initial and continuing compliance with ANSI/EIA - 748 guidelines to the designated DCMA Administrating Contracting Officer (ACO) assigned to a DCMA Contract Management Office (CMO).

Defense Contract Audit Agency (DCAA). The DoD organization tasked with monitoring a contractor's design and implementation of an acceptable accounting system.

Definitized. A contract, contract amendment, or contract supplemental agreement is considered definitized when the final contractual documents are unconditionally executed by both parties to the agreement.

Direct Cost. Any costs that may be identified specifically with a particular cost objective. That is, the portion of labor, material or other cost incurred or expended to meet contractual specifications for an end product, tool or other related service specifically identifiable to the contractually authorized task. It consists of those costs that can be reasonably and consistently related directly and finally to the contract, without distribution through an overhead unit or account.

Direct Labor. That portion of labor expended in the actual design, tooling, testing and the physical application of labor (including proofing) to material altering its shape, form, nature, or fulfilling a contractual requirement for service.

Discrete Effort. Tasks which have a specific end product or end result, and which through planning: (1) can be specifically defined and assigned a budget for accomplishment; (2) can be scheduled with clearly definable start and completion dates; and (3) contain criteria against which performance can be measured.

Discrete Milestone. A milestone which has a definite, scheduled occurrence in time signaling the finish of an activity, such as “release drawing,” “pipe inspection complete,” and/or signaling the start of a new activity. A type of “objective indicator.”

Earned Hours. The time in standard or budgeted hours credited to a worker or group of workers as a result of their completion of a given task or group of tasks.

Earned Value (EV). The budgeted value for work accomplished. The value of completed work expressed in terms of the budget assigned to that work. It is the sum of budgets for completed work packages and completed portions of open work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort. Also known as Budgeted Cost for Work Performed (BCWP).

Earned Value Management (EVM). A tool for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the execution of the project. EVM provides quantification of technical progress, enabling management to gain insight into project status and project completion costs and schedules. Two essential characteristics of successful EVM are EVM system data integrity and carefully targeted monthly EVM data analyses (i.e., risky WBS elements).

Earned Value Management System (EVMS). The integrated set of policies, processes, systems and practices that meet an organization's implementation of ANSI/EIA-748. An integrated management system and its related subsystems that allow for planning all work scope to completion; assignment of authority and responsibility at the work performance level; integration of the cost, schedule, and technical aspects of the work into a detailed baseline plan; objective measurement of progress (earned value) at the work performance level; accumulation and assignment of actual costs; analysis of variances from plans; summarization and reporting of performance data to higher levels of management for action; forecast of achievement of milestones and completion of events; forecast of final costs; and disciplined baseline maintenance and incorporation of baseline revisions in a timely manner.

Engineering Change Proposal (ECP). A proposed change, addition, or deletion to the basic contract, initiated by the contractor or customer.

Engineering Release. A procedure or method for the formal issuance of initial or updated engineering data, instructions and drawings of detail parts, assemblies and components of a new or modified product.

Estimate At Completion (EAC). A value (expressed in dollars and/or hours) developed to represent a realistic projection of the final cost of a task (or group of tasks) when completed. EAC is the sum of direct and indirect costs to date, plus the estimate of all authorized remaining work. EAC=Inception to date ACWP+ETC

Estimate To Complete (ETC). A value (expressed in dollars and /or hours) developed to represent a realistic projection of the "to go" cost of the unaccomplished work to complete a task.

Expenditure. A charge against available funds. It is evidenced by a voucher, claim, or other document approved by competent authority. Expenditure represents the actual payment of funds.

Fiscal Year. For the United States government, it is the 12 month period: 1 October through 30 September. For industry, it may be any formally selected annual accounting period including a calendar year.

Fixed Price Contracts. A category of contracts based on the establishment of a price to accomplish the required work. Types are: (a) firm fixed price; (b) fixed price with escalation; (c) fixed price redeterminable, and (d) fixed price with incentive provisions.

Front Loading. An action by a contractor to provide adequate or generous budget in the near-term budget baseline at the expense of the far-term effort. This practice delays acknowledgment of potential overrun conditions, frequently in the expectation that the contractor

can recover through subsequent changes in the contract statement of work. Front loading often results from an inadequate or unrealistic negotiated contract target cost and/or unrealistically optimistic planning of far-term effort.

Functional Organization. An organization or group of organizations with a common operational orientation such as Engineering, Manufacturing, (Fabrication, Assembly), Tooling, Quality Control, Material, Finance, Contracts, etc. See Organization Breakdown Structure (OBS).

Functional Manager. A line manager or supervisor of a functional organization.

Funding Profile. A display of program funding requirements normally presented on a cumulative basis by months or quarters. Plotting of the requirements is displayed as a "stair step" chart.

Gantt Chart. A horizontal bar chart. A graphic representation used as an aid to effective scheduling and control, showing graphically on a time scale when certain events are to take place or where deadlines occur. Status is displayed by either filling the bar or adding a filled-in status bar below it.

General & Administrative Expense (G&A). Expense incurred in the overall Corporate and Division offices, i.e., their cost of staff services such as, finance, legal, contract administration, sales, marketing and independent research and development (IR&D) effort. These expenses are allocated to organizational elements on the basis of total direct and indirect cost.

Indirect Budget. The target value established for costs to be incurred by persons and/or organizational elements for tasks or expenses that do not have a direct relationship to the design, testing and/or production of the end product or contractually specified task.

Indirect Cost. Costs that, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs. This term is further defined in FAR.

Indirect Cost Pools. A grouping of indirect costs identified with two or more cost objectives but not separately identified with any final cost objective. Such separate pools are normally established for indirect costs associated with Engineering, Manufacturing, Procurement, and/or Material, etc.

Integrated Baseline Review (IBR). A risk-based review conducted by the Program/Project Management to ensure a mutual understanding between the customer and supplier of the risks inherent in the supplier's PMB and to ensure the PMB is realistic for accomplishing all the authorized work within the authorized schedule and budget.

Integrated Surveillance Team (IST). Collectively the representatives of those organizations working together on the acquisition and administration of a contract or contracts. This could

include the PMO, DCMC, DCAA, the procuring activity integrated support components and the contractor.

Inter Divisional Work Authorization (IDWA). The document or procedure for "subcontracting" work between divisions of a company. Cost for authorized work by the performing division is transferred to the prime contracting division without G&A overhead and fee to preclude double charging on the prime contract. It is sometimes referred to as an Inter Group Work Authorization (IGWA) or as Inter Organizational Transfer (IOT).

Interim Budget. Furnished to departments on an interim basis for contractually authorized tasks for which a firm bid or estimate may not yet have been completed and negotiated. It is also used for task transfers between departments or elements of cost pending formal budget transfer. Interim budget is discontinued after budget values are formalized.

Internal Replanning. Replanning actions performed by the contractor for remaining effort within the recognized total allocated budget.

Joint Surveillance. Project surveillance conducted jointly by the supplier and customer (e.g., for contractor's this is typically performed by the contractor's EVMS organization, the cognizant DCMA and the customer).

Level Of Effort (LOE). Effort of a general or supportive nature that does not produce definite end products. Examples include supervision, program administration and contract administration.

Management Reserve (MR). An amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks. It is not a part of the Performance Measurement Baseline.

Master Planning Schedule (MPS). The highest summary level schedule for a contract depicting overall contract phasing and all major interfaces, contractual milestones, and program elements. (See Contract Master Schedule.)

Material. Property which may be incorporated into or attached to an end item to be delivered under a contract, or which may be consumed or expended in the performance of a contract. It includes, but is not limited to, raw and processed material, parts, components, assemblies, fuels and lubricants, and small tools and supplies.

Milestones. Events of particular significance. Finitely defined events that constitute the start or completion of a task or occurrence of an objective criterion for accomplishment. Milestones should be discretely identifiable; the passage of time alone is not sufficient to constitute a milestone. However, milestones should be associated with schedule data to document when the milestone is to occur. (See Objective Indicator.)

Negotiated Contract Cost (NCC). The estimated cost negotiated in a cost-plus-fixed-fee contract or the negotiated contract target cost in either a fixed-price incentive contract or a cost-plus-incentive-fee (or award fee) contract.

Network Schedule. A schedule format in which the activities and milestones are represented along with the interdependencies between activities. It expresses the logic as to how the program will be accomplished. Network schedules are the basis for critical path analysis, a method for identification and assessment of schedule priorities and impacts.

Non-Recurring Cost. Expenditures for specific tasks that are expected to occur only once, or very infrequently, on a given program. Examples are such costs as those for preliminary design effort, qualification testing, initial tooling, testing, planning, etc.

Objective Indicator. A finite event or accomplishment that can be used to definitively establish the degree of completion of a specific task.

Organizational Breakdown Structure (OBS). The project hierarchy of line and functional organizations as applied to the specific project.

Other Direct Cost (ODC). A group of accounting elements, other than direct labor and material, which can be isolated to specific tasks. ODC includes such items as travel, computer time, aviation fuel, etc.

Overhead. (See Indirect Costs.)

Overrun. Costs incurred in excess of the allocated budget for a task, group of tasks, or a contract. For work in process, the overrun is the cost incurred in excess of earned value.

Over Target Baseline (OTB). Replanning actions involving establishment of cost and/or schedule objectives that exceed the desired or contractual objectives on the program. An OTB is a new baseline for management when the original objectives cannot be met and new goals are needed for management purposes.

Performance Measurement Baseline (PMB). The time-phased budget plan against which contract performance is measured. It is formed by the budgets assigned to scheduled control account and the applicable indirect budgets. For future effort, not planned to the control account level, the performance measurement baseline also includes budgets assigned to higher level WBS elements and undistributed budgets. It equals the total allocated budget less management reserve.

Performing Organization. A defined unit within the contractor's organization structure, which applies resources to perform the work.

Planned Value. Same as Budgeted Cost for Work Scheduled.

Planning Package (PP). A logical aggregate of far-term effort within a control account that can be identified and budgeted, but not yet defined into discrete Work Packages.

Post Acceptance Review. A government review performed on a specific element or elements of a contractor's EVMS system that display(s) a lack of discipline or no longer meet(s) the intent of the EVMS Criteria.

Priced Bill-Of-Material System. An automated requirement generation system for material and parts, which lists all items, quantities, sources, descriptions and prices in an indentured listing, which relates a part of component to a higher or using assembly. Such a system may be used for pricing material costs for proposals.

Price Variance (PV). The portion of a material cost variance due to price change. The difference between the planned unit cost of materials and the actual unit cost of material. PV is derived by subtracting the planned unit price times the quantity used from the actual unit price times the quantity used.

Problem Analysis Report (PAR). A report made by the responsible manager to explain a significant cost or schedule variance, its probable impact on the program, and the corrective action(s) taken or required to resolve the problem (Same as Variance Analysis Report).

Procuring Activity. The subordinate command in which the Procuring Contracting Office (PCO) is located. It may include the Program Office and other related functional support activities.

Program (or Project or Product) Manager (PM). The person assigned the prime responsibility for overall management of a program (or project, or product).

Program Master Schedule. The highest summary level schedule for a major program depicting overall program phasing and interfaces, contractual milestones, and major events that support specific program objectives.

Program Work Breakdown Structure (PWBS). See part (a) of Work Breakdown Structure definition.

Progress Payments. Payments made to a contractor or subcontractor during the life of a fixed price type (firm fixed price and fixed price incentive) contract on the basis of a percentage of total incurred cost.

Purchase Order. An order issued by a functional organization (usually material or purchasing) to purchase parts, supplies or services from an outside source.

Purchase Request (PR). A contractor's authorizing procurement document that results in the issuance of a Purchase Order. Also referred to as a Purchase Order Request (POR).

Purchased Labor. A type of labor used on a contract basis to relieve an engineering or shop overload and/or to take advantage of special processing or technical skills or of special facilities possessed by a supplier.

Purchased Parts. Detail parts or small subassemblies that are purchased from or subcontracted to an outside source. Such parts or subassemblies are purchased to relieve a shop overload or because they are not within the prime contractor's normal capability to make.

Quantity Variance (QV). (See Usage Variance).

Risk Analysis. The system that provides a continuous analysis of identified risks with respect to their impact on program cost, schedule, and technical performance.

Realization Factor. The ratio of actual performance time to standard performance time, usually expressed as a decimal number.

Recurring Costs. Expenditures against specific tasks that occur on a repetitive basis. Examples are costs of sustaining engineering support, repeated fabrication or assembly of parts or products, tool maintenance, etc.

Replanning. The process by which a program or project updates or modifies its plans. This applies to a change in the original authorized PBB or CBB planning for accomplishing formally authorized requirements, typically involving the redistribution of budget for remaining work. In accordance with the ANSI/EIA-748, traceability is required to previous baselines, and funding requirements need to be considered in any replanning effort. There are two types of replanning:

- Internal Replanning. Replanning actions performed by the supplier for remaining effort within the recognized Project Budget Base or CBB. It is caused by a supplier's need to accommodate cost, schedule, or technical problems that may have made the original plan unrealistic. Internal replanning is restricted to remaining effort and if significant, the customer must be advised of the action.
- Authorized Change (or External) Replanning. A change necessitated by government/ customer direction which may be in the form of either a definitized or a no cost contract change order for contracts or formal change to the Project Plan for in-house Projects that calls for a change in the original plan. It most often results from a change in the authorized requirement affecting cost, schedule, technical parameter or a combination thereof.

Reprogramming (or Formal Reprogramming). A comprehensive replanning of the remaining PMB that result in an Over-Target Baseline (OTB), an Over-Target Schedule (OTS) or both. This type of replan is for performance measurement purposes only and requires prior coordination and approval of the Customer.

Responsible Organization. A defined unit within the contractor's organization structure that is assigned responsibility for accomplishing specific tasks. (See Performing Organization for comparison.)

Responsibility Assignment Matrix (RAM). A chart showing the relationship between the CWBS elements and the organizations assigned responsibility for ensuring their accomplishment. The RAM normally depicts the assignment of each control account to a single manager, along with the assigned budget.

Rolling Wave Planning. The progressive refinement of work definition as time goes on by continuous subdivision of downstream activities into detailed tasks.

Rubber Baselining. Actions by a contractor to advance far-term budgets into the current or early periods to mask current cost problems. The action involves moving budget without a corresponding amount of task, to cover current cost difficulties. It is an indication of likely overrun condition.

Schedule. A plan that defines when specified work must be started, worked on, and finished, to accomplish program objectives on time.

Schedule Performance Index (SPI). A measure of schedule efficiency. It compares the BCWP to the work scheduled (SPI = BCWP / BCWS). An index of 1.0 means the work is being performed right to the schedule. SPI > 1.0 means that the work is ahead of schedule. SPI < 1.0 means that the work is behind schedule.

Schedule Variance (SV). A metric for the schedule performance on a program. The algebraic difference between the earned value (BCWP) and the budget plan (BCWS). (SV=BCWP-BCWS) A positive value is a favorable condition while a negative value is unfavorable. It may be expressed for a specific period or cumulative to date.

Significant Variance. Those differences between planned and actual performance that require further review, analysis, and/or action.

Statement Of Work (SOW). The document that defines the work scope requirements on a program or contract.

Subcontract. A contract for services, data, parts, components, assemblies, other hardware, or software that a company commits to perform for or provide to the prime contractor. A subcontract normally involves the design or production of a component by the supplier to the prime contractor's specifications. "See Purchased Parts."

Summary Level Planning Package (SLPP). An aggregation of work for far-term efforts, not able to be identified at the control account level, but which can be assigned to higher level WBS elements (and is therefore not "undistributed budget").

Surveillance. The continuous process of reviewing the health of the earned value management system (EVMS) as applied to one or more projects.

Surveillance Plan. An annual plan that identifies the projects to be included in surveillance reviews, as well as the frequency and scope of the individual surveillance visits planned for each project included in the annual plan.

Task. A piece or portion of discrete, apportioned, or level-of-effort work. Also called an activity, something that takes place over a period of time and generally consumes resources.

Task Authorization. A document used in some contractor systems in conjunction with a Resource Authorization Document (RAD) to provide detailed work instructions and other technical information.

Thresholds. Boundaries or limits (monetary, time, or other values), which, if breached, result in some type of management review and action.

To-Complete Performance Index (TCPI). The future cost efficiency needed to accomplish the remaining work within a financial goal such as the Budget at Completion (BAC) or the Estimate at Completion (EAC). It compares the budget for remaining work with the remaining cost or the estimated remaining cost to complete the work. TCPIBAC = (BAC – BCWP cum) / (BAC – ACWP cum). Or TCPIEAC = (BAC – BCWP cum) / (EAC – ACWP cum). Compare the CPI to determine if the BAC or the EAC is realistic or not.

Total Allocated Budget (TAB). The sum of all budgets allocated to a project/contract. Total allocated budget consists of the PMB and all MR. The TAB should reconcile directly to the project/contract budget base. If the TAB is greater than the project/contract budget base, the difference is attributable to an over target baseline and must be documented.

Touch Labor. Production labor that can be reasonably and consistently related to a unit of work being manufactured, processed or tested. Also referred to as "Hands On" labor.

Undistributed Budget (UB). Budget associated with specific work scope or authorized changes that have not been assigned to a control account or lower level WBS element.

Unit Cost. Total labor, material, and overhead cost for one unit of product, i.e., one part, one end item etc.

Unpriced Changes. Authorized contract changes that are not yet priced.

Usage. The number of units or dollar value of material or items used over a period of time.

Usage Rate. A percentage, based on historical records, applied to the Priced Bill of Material to accurately budget for scrap, breakage, lost in shop, rework design, error and surplus material consumed on a project or contract.

Usage Variance (UV). The portion of material cost variance due to a change in quantity of material used. The difference between planned quantity of materials and the actual quantity used, expressed in dollars. UV is derived by subtracting from planned quantity times planned unit cost, the actual quantity times planned unit cost. (Same as Quantity Variance.)

Variance Analysis Report (VAR). An internal document, within an earned value management system, for the analysis and reporting of variances which breech the established thresholds. It requires the reason or cause of the variance; the impact on cost or schedule; and the corrective action required, or accomplished, on significant variances.

Variance At Completion (VAC). The difference between the total budget assigned to a contract, WBS element, organizational entity or control account and the estimate at completion. It represents the amount of expected overrun or underrun. (VAC equals BAC minus EAC, i.e., total allocated budget minus the related estimated final cost).

Variance Threshold. Internal and external tolerances (or thresholds), which are established by management direction, or negotiation with the customer and which, when exceeded, require investigation, analysis, reporting and corrective action.

Work Breakdown Structure (WBS). A product-oriented hierarchical breakdown or division of hardware, software, services, and other work tasks that organizes, displays, and defines the products to be developed and/or produced and relates the elements of the work to be accomplished to each other and the end product(s).

Work Breakdown Structure Dictionary. A document that describes the tasks associated with each WBS element, in product-oriented terms, and relates each element to the respective, progressively higher levels of the structure as well as to the contract Statement of Work. May or may not be a contractual requirement.

Work Breakdown Structure Element. A single discrete portion of a WBS. May be an identifiable product, a set of data, or a service.

Work Package (WP). A detail, short duration task or material item identified by the Project Control Account manager for accomplishing a Control Account task. A work package has the following characteristics:

- Represents unit of work at the level where work is performed.
- Clearly separate from other Work Packages.
- Assignable to a single organizational element.

- Has scheduled start and completion dates, and interim milestones, if required, all of which represent physical accomplishment.
- Has budget expressed in terms of dollars or hours/FTEs.
- Its duration is limited to a relatively short span.
- Is integrated with detailed engineering, shop, or other schedules.
- Has a correct Earned Value Technique assigned to it.

Work Package Budgets. Resources that are formally assigned by the contractor to accomplish a work package, expressed in dollars, hours, standards or other definitive units

APPENDIX P CxP CANDIDATE RISK ASSESSMENT FORM

CxP Candidate Risk Assessment Form

Candidate Risk: The IBR Team member will identify a candidate risk based on a combination of the likelihood of an undesired event…and the consequences if the event were to occur to the Constellation Program's goals and objectives as related to Technical, Cost, and Schedule.	**Date:**
	Classification:
	Technical (Yes or No):
	Cost (Yes or No):
	Schedule (Yes or No):
Owning Organization:	
Condition Statement (a phrase briefly describing current key circumstances, situations, etc. that are causing concern, doubt, or anxiety):	
Consequence Statement (a phrase that describes the key, negative outcome of the current condition):	
Context (any additional information to support your identification of this risk):	
IBR Team Member Signature:_____ **Print Name:**_____	
IBR Team/Sub-team Lead Signature:_____ **Print Name:**_____	
IBR Risk Management Officer Signature:_____ **Print Name:**_____	